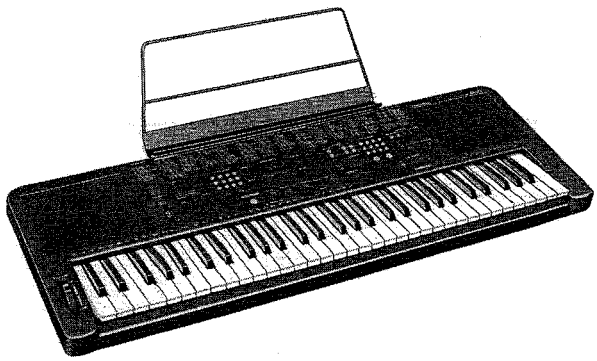
ORDER NO. EMID931441
A5

Service Manual

PCM Keyboard

SX-KN470

(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW), (EA), (EP), (EK), (XL), (XR), (XS), (XD), (X), (XT)



AREAS

(M):	U.S.A.	(EK):	the United Kingdom
(MC):	Canada	(XL):	New Zealand
(XM):	Mexico	(XR):	Australia
(EN):	Norway, Sweden, Denmark, Finland	(XS):	Malaysia, Singapore, South Africa
(EH):	Holland, Belgium	(XD):	Saudi Arabia, Kuwait
(EF):	France, Italy	(X):	the Middle East, Indonesia, Hong Kong, the Philippines, Thailand
(EZ):	Germany		
(EW):	Switzerland		
(EA):	Austria		
(EP):	Spain, Portugal, Greece	(XT):	Taiwan

■ Specifications

KEYBOARD		61 KEYS (WITH INITIAL TOUCH)
SOUND GENERATOR		PCM
MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY		32 NOTES
SOUNDS	SOUND SELECT	100 SOUNDS
	EFFECT	DIGITAL EFFECT, SUSTAIN
RHYTHM	RHYTHM SELECT	100 PATTERNS
	CONTROLS	START/STOP, SYNCHRO, INTRO & ENDING, FILL IN 1, 2, COUNT INTRO, TEMPO
	KEYBOARD PERCUSSION	36 KEYS
DIGITAL REVERB		○
AUTO PLAY CHORD		ONE FINGER, FINGERED, ONE TOUCH PLAY
TECHNI-CHORD		○
PANEL MEMORY		SET, 1, 2
SEQUENCER	TRACK	3 TRACKS (POLY 1, POLY 2, ACCOMP/CHORD)
	STORAGE CAPACITY	APPROX. 1400 NOTES
	INPUT MODES	REALTIME, STEP (CHORD)
DISPLAY		LED (4 DIGITS)
CONTROLS		MAIN VOLUME, BALANCE, TRANSPOSE, CONDUCTOR
DEMO		○
MODE SET		INITIAL, SEQUENCER CLEAR, FOOT SWITCH SETTING, TUNING, PITCH BEND RANGE, TOUCH ON/OFF, REVERB TYPE & DEPTH, SUB BALANCE, MIDI BASIC CH, MIDI OTHERS, MIDI SYSTEM EXCLUSIVE
TERMINALS		DC IN 12V, PHONES/LINE OUT, MIDI (IN, OUT), FOOT SWITCH
OUTPUT		3 W × 2 (WITH BATTERIES), 8 W × 2 (WITH SY-AD6/SY-AD6B AC ADAPTOR)
SPEAKERS		12 cm × 2

Technics

POWER REQUIREMENT	BATTERIES: DC 9V (USING R20/LR20["D" SIZE, UM-1] BATTERIES × 6) AC: WITH SY-AD6 AC ADAPTOR AC 120/220/230/240V, 50/60 Hz AC 120V, 60Hz (NORTH AMERICA AND MEXICO) WITH SY-AD6B AC ADAPTOR AC 230V, 50/60 Hz (EUROPE EXCEPT FOR UNITED KINGDOM)
DIMENSIONS (W×H×D)	96.0 cm × 13.5 cm × 36.2 cm (37-25/32" × 5-5/16" × 14-1/4")
NET WEIGHT	6.8 kg (15.0 lbs)
ACCESSORIES	MUSIC STAND

* Specifications are subject to change without notice for further improvement.

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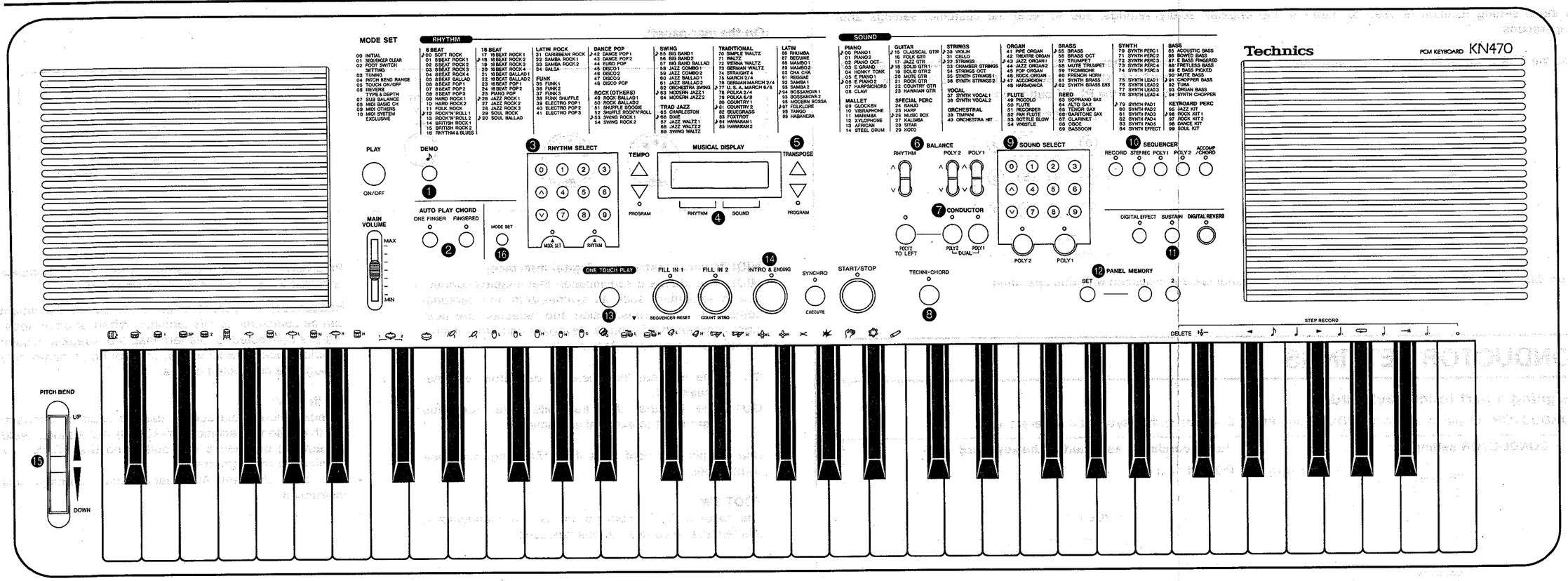
ARRANGEMENT OF CONTROL PANEL



❶ **DEMO**
Prerecorded performances are used to demonstrate the individual appeal of the rhythms, sounds and other features.

❷ **AUTO PLAY CHORD**
An automatic accompaniment appropriate for the selected rhythm is produced when you play a chord. Specify chords with either the **ONE FINGER** or **FINGERED** method.

❸ **RHYTHM SELECT**
Choose from 100 preset automatic rhythm patterns. Specify a two-digit number on the number pad to select a rhythm. The tempo is adjusted with the two **TEMPO** buttons.

❹ **MUSICAL DISPLAY**
In the normal mode, the display indicates the numbers of the selected sound and rhythm. The display also shows pertinent information when using the **SEQUENCER** and **MODE SET** functions.

❺ **TRANSPOSE**
C is the standard setting, but you can raise or lower the key of the entire instrument with these two buttons. The two buttons are also used in conjunction with some of the **MODE SET** functions to adjust the settings.

❻ **BALANCE**
The **BALANCE** buttons are used to select 10 different volume levels for each part—**POLY 1**, **POLY 2** and **RHYTHM**.

❼ **CONDUCTOR**
Used to assign the **POLY 1** and **POLY 2** parts to the keyboard in various ways. The two parts can even be layered (dual sound) or assigned to different sections of the keyboard (split keyboard).

❽ **TECHNI-CHORD**
Chord notes played on the left section of the split keyboard are added to melody notes played on the right section. Choose from four harmonic styles.

❾ **SOUND SELECT**
Use the number pad to choose from 100 different sounds. Sound numbers **95-99** are **KEYBOARD PERCUSSION** sounds.

❿ **SEQUENCER**
With this feature you can record an entire song or store a chord progression, then have the performance played back automatically.

⓫ **Effects**
Turn the **DIGITAL REVERB** button on to add reverberation to the sound. **DIGITAL EFFECT** gives the sound a thickness and diffusion. When **SUSTAIN** is on, the musical tones fade gradually after the keys are released.

⓬ **PANEL MEMORY**
Set up the sounds and effects, and then store them in these 2 buttons for instant recall as you play. You can expand the range of storable settings.

⓭ **ONE TOUCH PLAY**
Select a rhythm and press the **ONE TOUCH PLAY** button until the panel settings change. The sounds and effects perfect for the selected rhythm are automatically set in seconds.

⓮ **Rhythm control**
START/STOP, **SYNCHRO**, **INTRO & ENDING** and **FILL IN 1** and **2** give you complete control over and add variety and interest to your rhythm performance.

⓯ **PITCH BEND**
This wheel is moved up or down with your hand to create a continuous change in pitch. The wheel returns to the center position automatically when it is released.

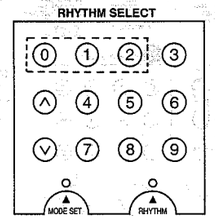
⓰ **MODE SET**
Used in conjunction with various settable functions and storable memories, including two song memories, tuning, pitch bend range, MIDI settings and setting initialization.

INITIAL SETTING

■ The initial setting function is used to return to the original factory settings, and to reset the customer settings and misoperations.

1. Press the **PLAY** button to turn off the instrument.

2. While pressing the three number buttons on the **RHYTHM SELECT** section (**0**, **1** and **2**) at the same time, turn the **PLAY** button on again.

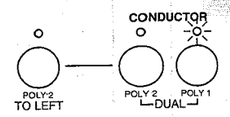
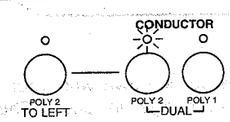
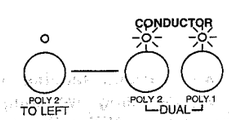
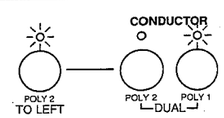


NOTE:
All stored data in the **SEQUENCER**, and **MODE SET** other settings are initialized with this operation.

CONDUCTOR SETTINGS

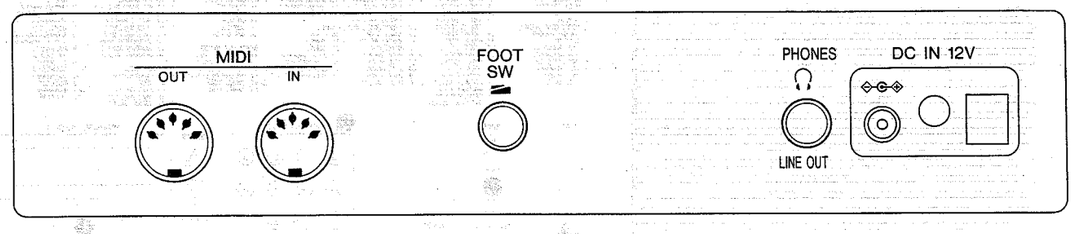
■ Assigning a part to the keyboard

The **CONDUCTOR** is used to assign the **POLY 1** and **POLY 2** sounds to the keyboard in different ways.

CONDUCTOR settings	How sounds are assigned to the keyboard
	All the keys play **POLY 1** sounds. **POLY 1**
	All the keys play **POLY 2** sounds. **POLY 2**
	All the keys play both **POLY 1** and **POLY 2** sounds at the same time (dual sound). **POLY 1 + POLY 2**
	The right keys play **POLY 1** sounds and the left keys play **POLY 2** sounds (split keyboard). **POLY 2** | **POLY 1**

TERMINALS

(On the rear panel)



MIDI (Musical Instrument Digital Interface)
MIDI is the standard specification that enables connection to equipment such as synthesizers and personal computers. Data transmission and reception are possible between the Technics Keyboard and other instruments provided with MIDI terminal.

IN: The terminal that receives data from external equipment.
OUT: The terminal that transmits data from this instrument to external equipment.

- Use a 5-pin DIN cord (less than 15m long) for these connections.

FOOT SW
The optional SZ-P1 Foot Switch can be connected to this terminal to control various functions.

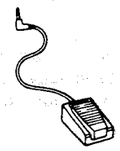
PHONES (∩ : use headphones with over 16 Ω impedance)/**LINE OUT** (output level 1.5 Vrms, 16 Ω)

Headpnoes, a keyboard amplifier, or stereo equipment can be connected to this terminal. When another apparatus is connected to this terminal, the speaker system is automatically switched off, and sound is heard only through the connected device.

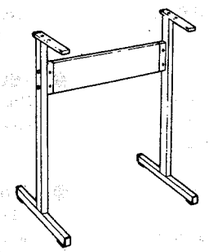
DC IN (12V)
Standard household current can be used by connecting the optional Technics SY-AD6(B) AC adaptor (sold separately) between a wall outlet and the DC IN 12V terminal on the instrument.

- Use of a different AC adaptor may damage this instrument.

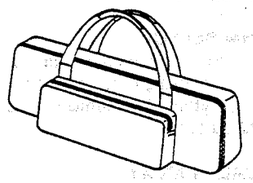
OPTIONS



SZ-P1
Foot Switch

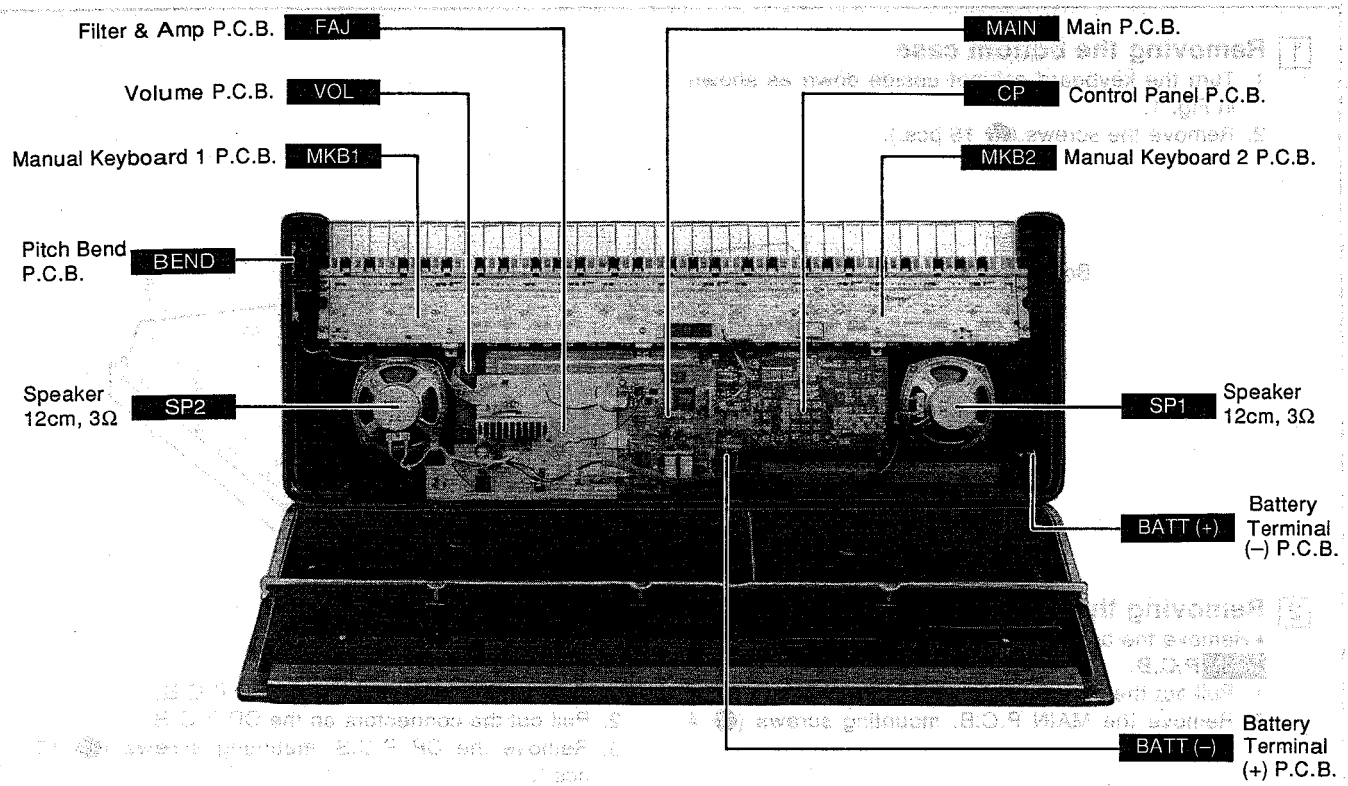


SZ-S61
Keyboard Stand



SZ-B7
Carrying Bag

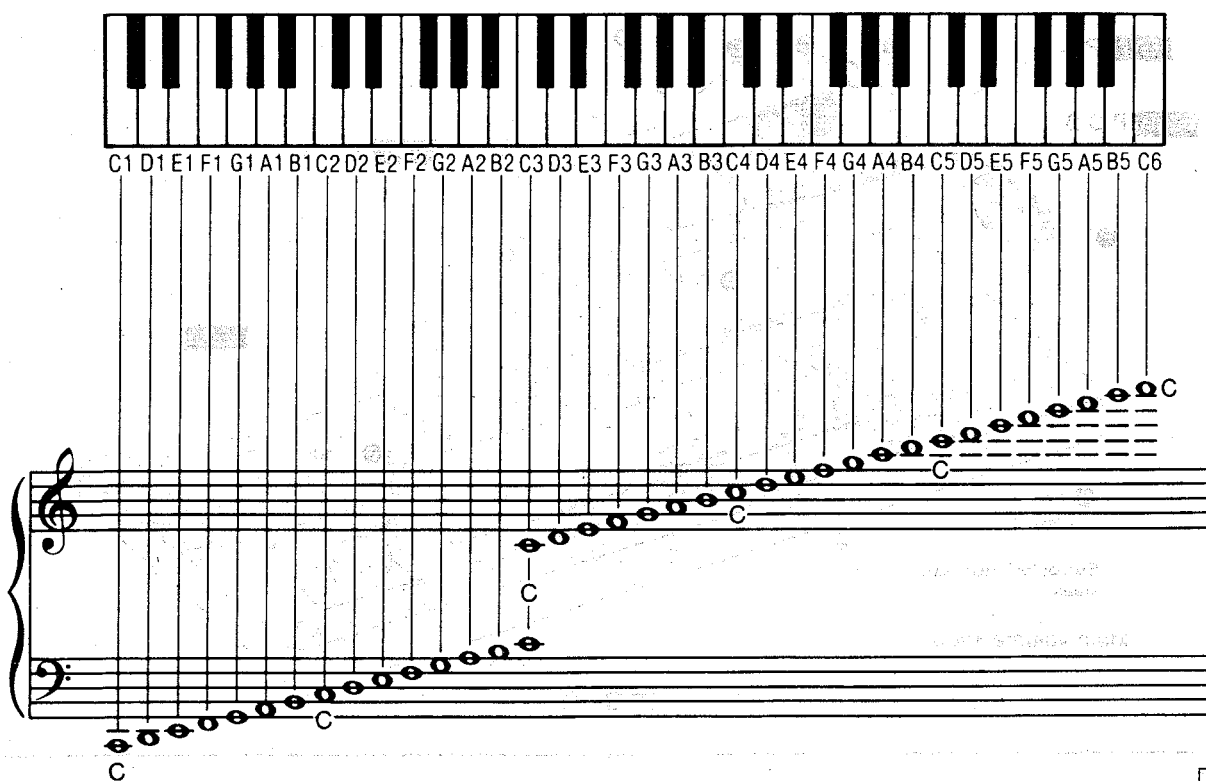
PARTS LOCATION


Filter & Amp P.C.B. FAJ
Volume P.C.B. VOL
Manual Keyboard 1 P.C.B. MKB1
Pitch Bend P.C.B. BEND
Speaker 12cm, 3Ω SP2
MAIN Main P.C.B.
CP Control Panel P.C.B.
MKB2 Manual Keyboard 2 P.C.B.
SP1 Speaker 12cm, 3Ω
BATT (+) Battery Terminal (–) P.C.B.
BATT (–) Battery Terminal (+) P.C.B.

[Photo-1]

KEYBOARD RANGES

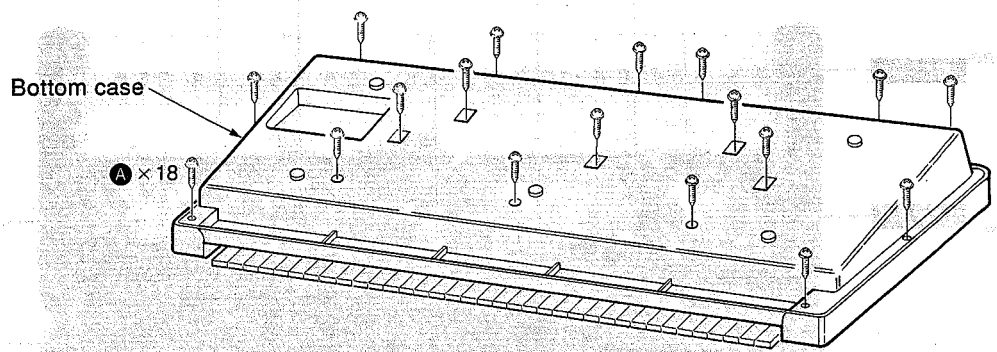
• This keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.



DISASSEMBLY INSTRUCTIONS

1 Removing the bottom case

1. Turn the keyboard cabinet upside down as shown in Fig. 1.
2. Remove the screws (Ⓐ 18 pcs.).



[Fig.1]

2 Removing the printed circuit boards

• Remove the bottom case (see Step 1).

MAIN P.C.B.

1. Pull out the connectors on the MAIN P.C.B.
2. Remove the MAIN P.C.B. mounting screws (Ⓑ 4 pcs.).

FAJ VOL P.C.B.

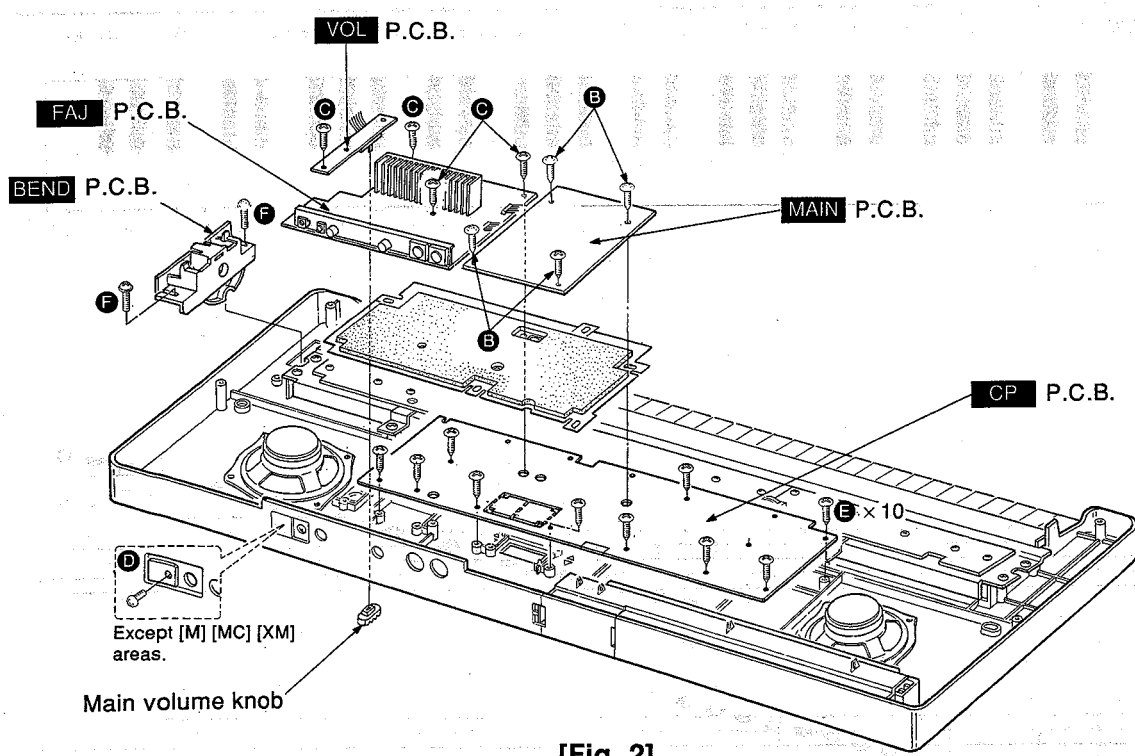
1. Remove the main volume knob.
2. Pull out the connectors on the FAJ P.C.B.
3. Remove the FAJ and VOL P.C.B. mounting screws (Ⓒ 4 pcs. and Ⓓ 1 pc.).

CP P.C.B.

1. Remove the MAIN and FAJ, VOL P.C.B.
2. Pull out the connectors on the CP P.C.B.
3. Remove the CP P.C.B. mounting screws (Ⓔ 10 pcs.).

BEND P.C.B. Ass'y

1. Pull out the connector on the BEND P.C.B.
2. Remove the BEND P.C.B. Ass'y mounting screws (Ⓕ 2 pcs.).



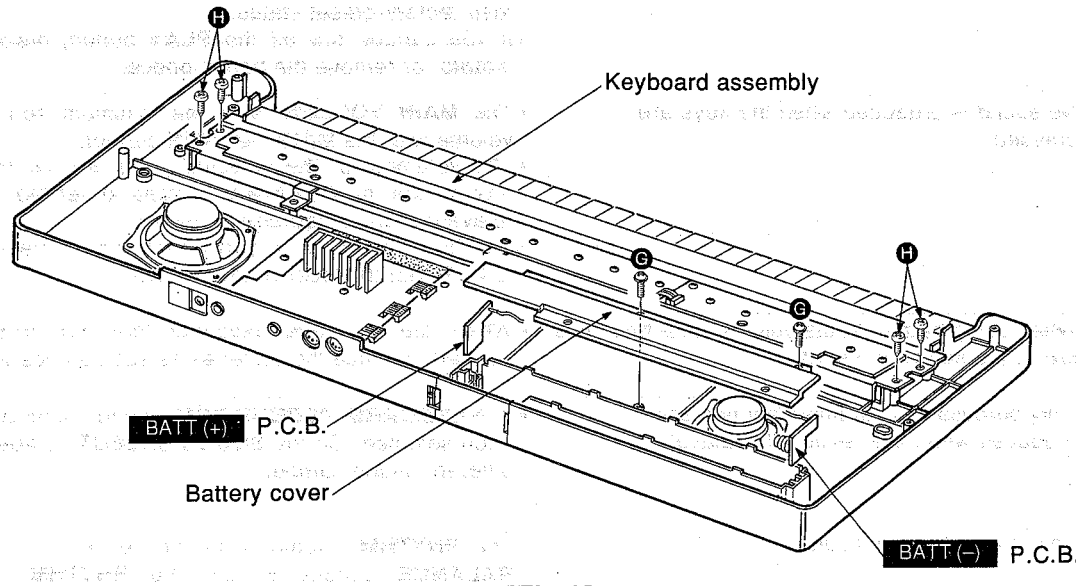
[Fig. 2]

3 Removing the BATT (+) and BATT (–) printed circuit boards

1. Remove the bottom case (see Step 1).
2. Remove the screws (G 2 pcs.).
3. Pull out the BATT (+) P.C.B. and BATT (–) P.C.B. from the cabinet.

4 Removing the keyboard assembly

1. Remove the bottom case (see Step 1).
2. Remove the keyboard assembly holding screws (H 4 pcs.).

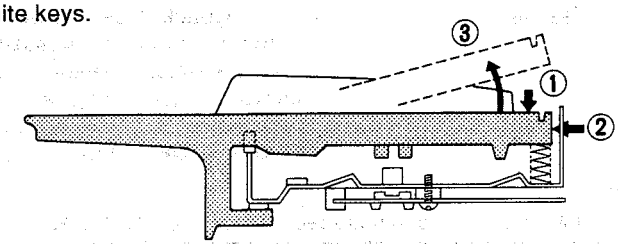


[Fig.3]

5 Removing the key(s)

1. Remove the keyboard assembly (see Step 4).
2. Press the rear of the key downward (Fig. 4-①).
3. Press the rear edge of the key while pressing the rear of the key downward (Fig. 4-②).
4. To remove the key, lift it as shown in Fig. 4-③.

NOTE:
If a black key is to be replaced it is necessary to remove both adjacent white keys.



[Fig. 4]

■ ABOUT OPERATION CHECK

If necessary to check the operation with removing MAIN, FAJ P.C.B. from the top cover, use follwing longer extention flat cables. It will produce better service check with Power switch ON.
Please refer wiring connection diagram II-1.

W6: SWKG1513SSA (15 pins) W7: QEXG14001SSA (14 pins)

SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

ıe following changes in performance may occur in the Technics Keyboard but do not indicate trouble.

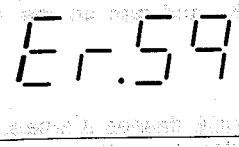
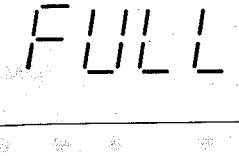
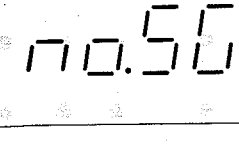
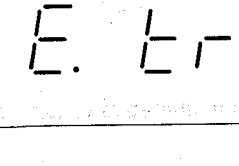
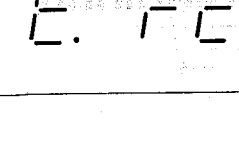
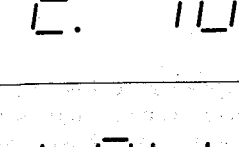
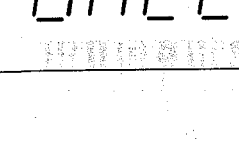
	Phenomenon	Remedy
Sounds and effects	The buttons, keys, etc. malfunction.	• Turn off the **PLAY** button once, then turn it on again. If this procedure is not successful, turn off the **PLAY** button once. Then, while pressing the three lower number buttons on the **RHYTHM SELECT** number pad (**0**, **1** and **2**) at the same time, turn the **PLAY** button on again. (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.) • If you cannot turn off the **PLAY** button, disconnect the AC adaptor or remove the baries onece.
	No sound is produced when the keys are pressed.	• The **MAIN VOLUME** is at the minimum setting. Adjust the volume with the **MAIN VOLUME** control. • The volumes for the selected parts are set to the minimum levels. Use the **BALANCE** buttons to set the volumes of the relevant parts to appropriate levels. • The local control for a part performed on the keyboard is set to OFF. Set the local control to ON.
	When using batteries, the volume level becomes low or the sound is distorted.	• When the message indicates that the batteries are low appears, replace the batteries as soon as possible.
	Only percussive instrument sounds are produced when the keyboard is played.	• A **KEYBOARD PERCUSSION** sound (numbers **95–99**) has been selected. On the **SOUND SELECT** number pad, select a different sound number.
Rhythm	The rhythm does not start.	• The **RHYTHM** volume is set to the minimum level. Use the **BALANCE** buttons to set the **RHYTHM** volume to an appropriate level. • The MIDI CLOCK is set to MIDI. Set the MIDI CLOCK to INT.
AUTO PLAY CHORD	No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced.	• The **RHYTHM** volume is set to the minimum level. Use the respective **BALANCE** buttons to set the **RHYTHM** volume to appropriate levels.
SEQUENCER	Storage is not possible.	• The remaining storage capacity of the **SEQUENCER** is 0. Follow the **SEQUENCER CLEAR** procedure to erase the memory.
	Multi-track storage is not possible.	• The playback track has been selected, but the **START/STOP** button has not been pressed. A flashing track indicator shows the track which is ready for recording, and a lit track indicator shows a track which is ready for playback. To record one track while listening to another (playback) track, press the **START/STOP** button to begin playback.

■ The maximum number of notes which can sound simultaneously for each part is as shown below.

	During performance	During MIDI reception	
POLY 1	8	16	The maximum number of notes which can sound simultaneously for all parts combined is 32.
POLY 2	8	16	
ACCOMP 1	4	8	
ACCOMP 2	4	8	
ACCOMP 3	4	8	
BASS	1	8	
DRUMS	6	8	

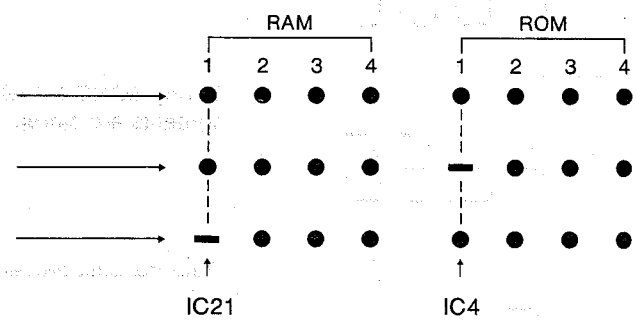
ERROR DISPLAY

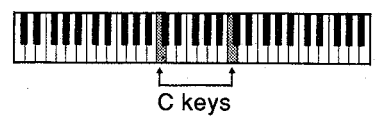
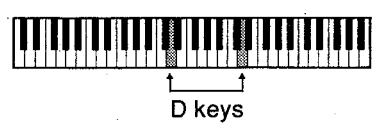
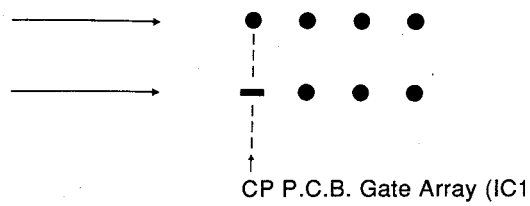
The following error messages inform you of a problem in operation or status.

	Error display	Reason
SEQUENCER		Recording data error. Playing back is not possible.
		The memory is full. No more data can be stored in the **SEQUENCER**.
SONG		During SONG LOAD, you attempted to load a SONG memory for which no contents are stored.
MIDI SYSTEM EXCLUSIVE		Data transmit procedure failure.
		Data receive procedure failure.
		You attempted to receive data from a different model.
BATTERIES		The batteries are almost consumed.

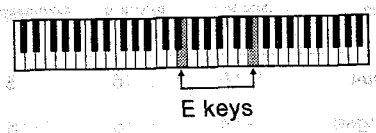
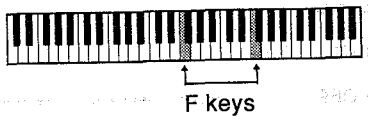
ABOUT THE SELF-DIAGNOSTIC FUNCTION

This model has a self-diagnostic function. When set to the self-diagnostic mode, the quality can be assessed when the diagnostic procedures in the chart below are followed.

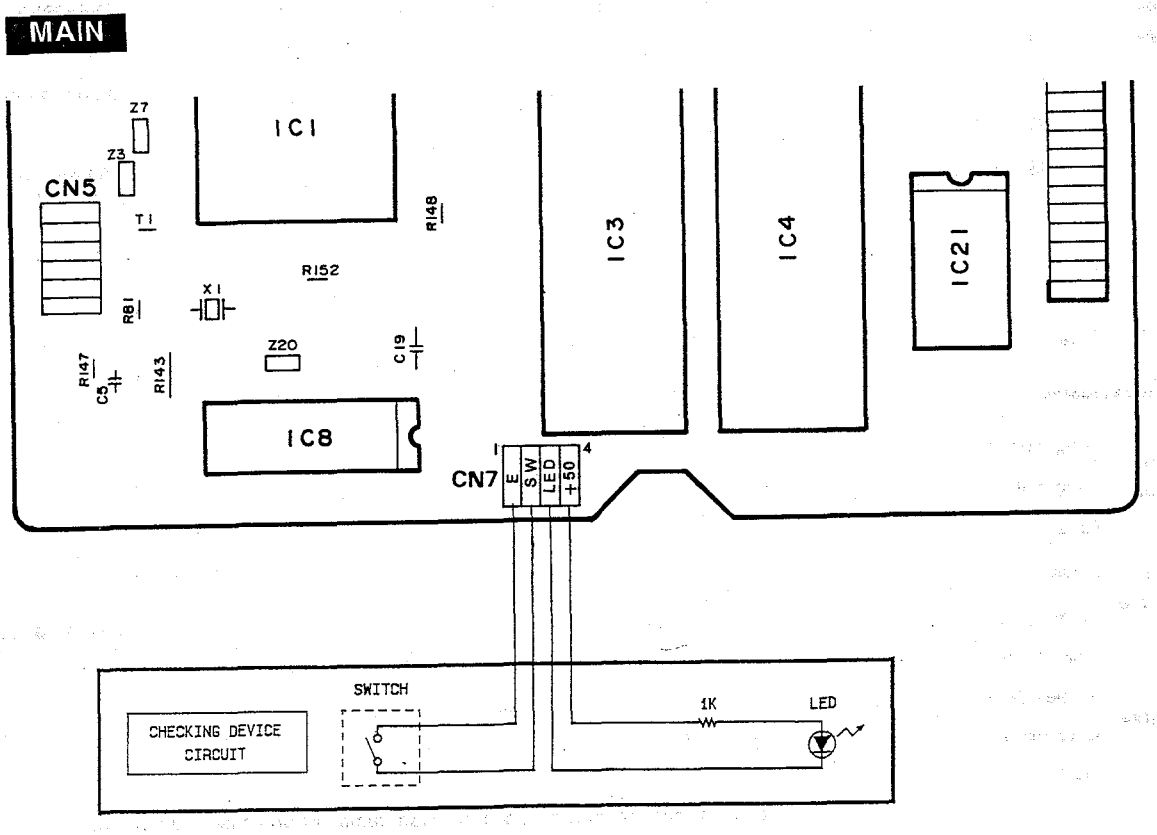
<table>
<tr><th>No.</th><th>PCB</th><th>TEST MODE</th><th>Procedure</th></tr>
<tr><td>1</td><td>MAIN</td><td>RAM (IC21), ROM (IC4) check</td><td>1. Connect the CHECKING DEVICE (refer to page I-12) to CN7 on the MAIN P.C.B., and turn on the CHECKING DEVICE switch.
2. Turn on the play switch.</td></tr>
<tr><td></td><td></td><td colspan="2">When the play switch is turned on, the LED of the CHECKING DEVICE flashes 8 times. The first 4 flashes are for the RAM check, and the latter 4 flashes are for the ROM check. The order of the LED flashes corresponds to the respective IC numbers as shown below. If an IC is defective, the corresponding flash time is longer.
Examples
 

Note: ● indicates short flash time = OK
▬ indicates long flash time = Defective</td></tr>
<tr><td>2</td><td>MAIN</td><td>V25 Gate array (IC2) check</td><td>While pressing two C keys simultaneously, turn on the play switch.
 
</td></tr>
<tr><td></td><td></td><td colspan="2">Monitor pins 46~48 (DL6~DL4) of IC2 on an oscilloscope, and check whether incremental data (see figure) is output.
</td></tr>
<tr><td>3</td><td>CP</td><td>Control panel gate array check</td><td>1. Connect the CHECKING DEVICE to CN7 on the MAIN P.C.B. (The Checking Device switch should be off.)
2. While pressing two D keys simultaneously, turn on the play switch.
 
</td></tr>
<tr><td></td><td></td><td colspan="2">When the play switch is turned on, the LED of the CHECKING DEVICE flashes 4 times. The order of the LED flashes corresponds to the gate arrays (IC) on the respective P.C.B.s as shown below. If an IC is defective, the corresponding flash time is longer.
1. OK
2. CP Gate Array defective
 

Note: ● indicates short flash time = OK
▬ indicates long flash time = Defective</td></tr>
</table>

No.	PCB	TEST MODE	Procedure
4	MAIN	Wave ROM (IC13) check	While pressing two E keys simultaneously, turn on the play switch.  E keys
		When set to the self-diagnostic mode, the Wave ROM outputs a sine wave. If no sound is produced, or if the sound is distorted, the Wave ROM is defective.	
5	CP	LED, 7-segment LED (display) & SW check	While pressing two F keys simultaneously, turn on the play switch.  F keys
		All the LEDs turn off after lighting once. Confirm that all the LEDs light.	

■ Connection between serving CHECKING DEVICE and MAIN PCB



MIDI IMPLEMENTATION CHART

(Transmitted)

Function		POLY 1	POLY 2	ACCOMP 1	ACCOMP 2	ACCOMP 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1–16	1–16	1–16	1–16	1–16	1–16	1–16	1–16	memorized
	Changed	1–16	1–16	1–16	1–16	1–16	1–16	1–16	1–16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF, POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	—	—	
Note Number		0–119	0–119	0–119	0–119	0–119	0–119	36–71** (KN470) 36–80** (KN650)	—	Changes depending on the position of the transpose control and octave shift.
	True voice	—	—	—	—	—	—	—	—	
Velocity	Note ON	○	○	○	○	○	○	○	—	
	Note OFF	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	—	
After Touch	Key's	×	×	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	×	×	
Pitch Bender		○	○	○	○	○	○	×	×	
Control Change	0, 32	○	○	○	○	○	○	○	×	bank select (TECH only)
	1	○***	○***	○***	○***	○***	○***	×	×	modulation
	7	○	○	○	○	○	○	○	×	volume
	11	×	×	×	×	×	×	×	○	expression pedal
	64	○	○	○	○	○	○	×	×	sustain
	80	×	×	○	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	×	○	×	intro, fill in, ending
	93	○	○	○	○	○	○	×	×	chorus (DIGITAL EFFECT)
Prog Change		○	○	○	○	○	○	○	×	
	True #	—	—	—	—	—	—	—	—	
System exclusive		○								
System common	Song Pos	×								
	Song Sel	×								
	Tune	×								
System Real Time	Clock	○								
	Commands	○× *								start/stop, continue
Aux Messages	Local ON/OFF	×	×	×	×	×	×	×	—	
	All notes OFF	×	×	×	×	×	×	×	—	
	Active Sense	○								
	Reset	×								
Notes		* ○ × .....Whether or not the data for each of these items is transmitted can be set. **When the program change mode is set to TECH, note numbers for **DRUMS** differ. ***Transmitted during **SEQUENCER** playback and during rhythm performance.								

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes
Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

(Recognized)

Function		POLY 1	POLY 2	ACCOMP 1	ACCOMP 2	ACCOMP 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1–16	1–16	1–16	1–16	1–16	1–16	1–16	1–16	memorized
	Changed	1–16	1–16	1–16	1–16	1–16	1–16	1–16	1–16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF, POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	—	—	
Note Number		0–127	0–127	0–127	0–127	0–127	0–127	36–71 (KN470) 36–80 (KN650)	—	Changes depending on the position of the transpose control, octave shift, and sound.
	True voice	0–127	0–127	0–127	0–127	0–127	0–127	36–71 (KN470) 36–80 (KN650)	—	
Velocity	Note ON	○	○	○	○	○	○	○	—	
	Note OFF	×	×	×	×	×	×	×	—	
After Touch	Key's	×	×	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	×	×	
Pitch Bender		○	○	○	○	○	○	×	×	
Control Change	0, 32	○	○	○	○	○	○	○	×	bank select (TECH only)
	1	○	○	○	○	○	○	×	×	modulation
	7	○	○	○	○	○	○	○	×	volume
	11	×	×	×	×	×	×	×	○	expression pedal
	64	○	○	○	○	○	○	×	×	sustain
	80	×	×	○	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	×	○	×	intro, fill in, ending
	93	○	○	○	○	○	○	×	×	chorus (DIGITAL EFFECT)
Prog Change		○	○	○	○	○	○	○	×	
	True #	0–99 0–3**	0–99	0–94	0–94	0–94	0–94	0–99	—	
System exclusive		○								
System common	Song Pos	×								
	Song Sel	×								
	Tune	×								
System Real Time	Clock	○								
	Commands	○×*								start/stop, continue
Aux Messages	Local ON/OFF	×	×	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	○	○	—	
	Active Sense	○								
	Reset	×								
Notes		* ○ × .....Whether or not the data for each of these items is received can be set. **Panel memory program change								

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes
Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

PRECAUTIONS BEFORE SERVICING

■ Precautions for measuring of the output waveforms.

1. The waveform was measured with a "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of musical tone signals shown may differ somewhat due to the difference in the timing of triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2V/cm should be 2.0V/cm).
3. To measure the waveforms, first set this unit to the self-diagnostic mode (refer to page I-12, No. 4). The WAVE ROM output will then be output as a sine wave to facilitate the servicing check.

■ Important safety notice:

Components identified by a ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

■ Symbolic Marks

The symbolic marks for resistors and capacitors which used in this circuits are classified as following TABLE-1 and TABLE-2.

1. RESISTORS
   - Resistors without symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
   - All resistors are 1/4WATT, ±5% TOLERANCE unless otherwise deisgnated in the schematic diagrams.

(TABLE-1)

SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
Ⓕ	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD—F—type)	Ⓕ	Fixed Metal Film Resistors "FLAME-PROOF" (ERX—type)
Ⓕ	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF—type)	[F]	Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ—type)
Ⓕ	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG—type)	[F]	Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF" (ERD2FC—type)
Ⓖ	Fixed Metal Film Resistors (Precision and High Stability) (ERO—type)		

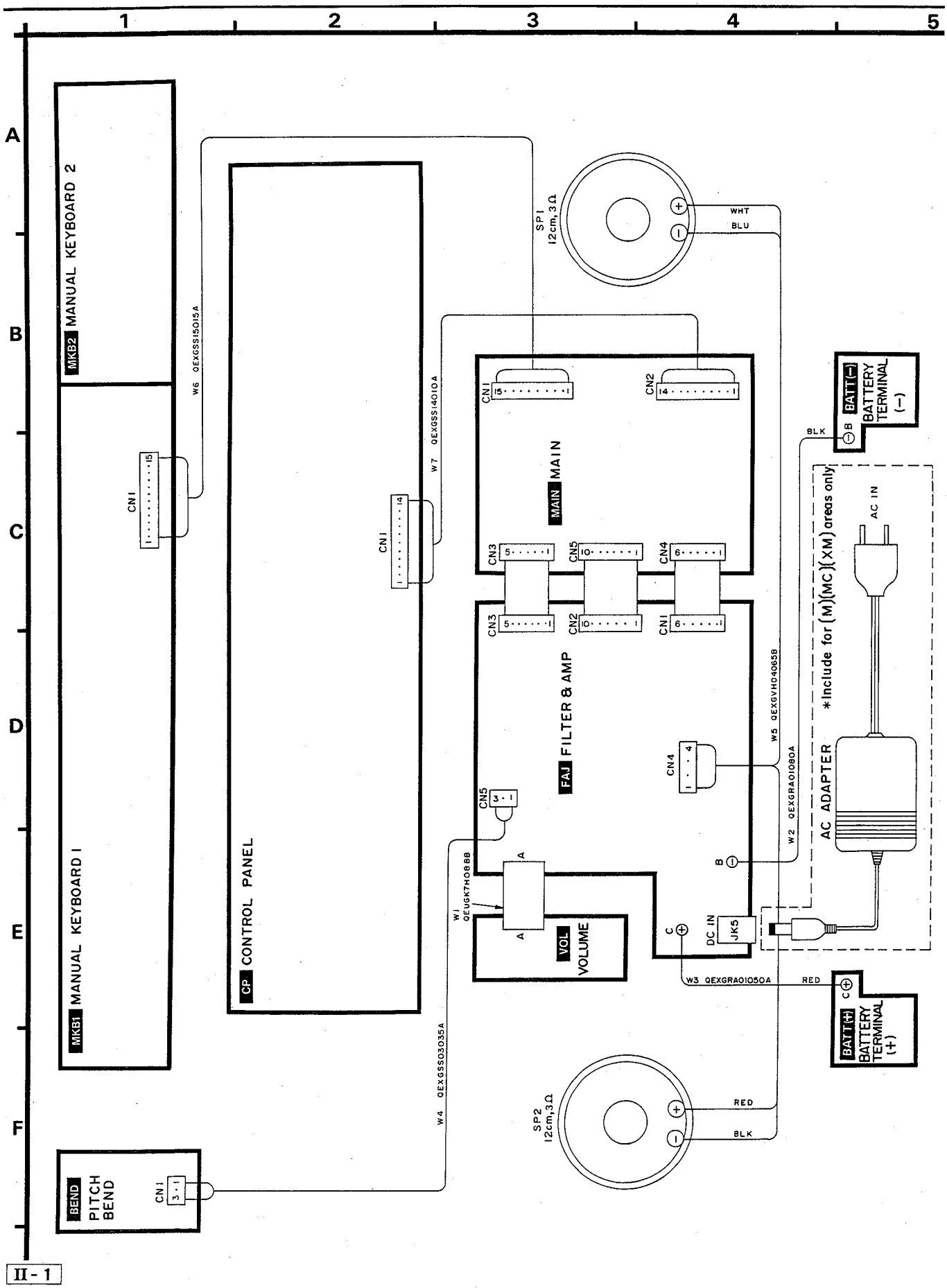
2. CAPACITORS
   - Capacitors without symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ±10% Tolerance)
   - Polarized capacitors without symbolic mark are Aluminum Electrolytic Capacitors. (ECEA—type, ±20% Tolerance)

(TABLE-2)

SYMBOL	SPECIFICATION	TYPE
Ⓝ	Non-Polarized Electrolytic Capacitors	ECEA__KN__type
Ⓨ	Non-Polarized Electrolytic (for Network System)	ECEA__Y__type
Ⓣ	Tantalum Solid Electrolytic Capacitors	ECS__type
(TF)	Metalized Plastic Film Capacitors (TF Series)	ECQV__type
○	Temperature Compensating Ceramic Capacitors	ECC__type
	High-Dielectric Constant Ceramic Capacitors	ECK__type ECR__type
	Axial Lead Ceramic Capacitors	ECB__type
	Metalized Polyester Film Capacitors for Across the Line	ECQ__EW__type
	Aluminum Electrolytic Capacitors for Smoothing Circuit	ECES__type
	Multilayer Ceramic Chip Capacitors	ECUV__type

MEMO

WIRING CONNECTION DIAGRAM

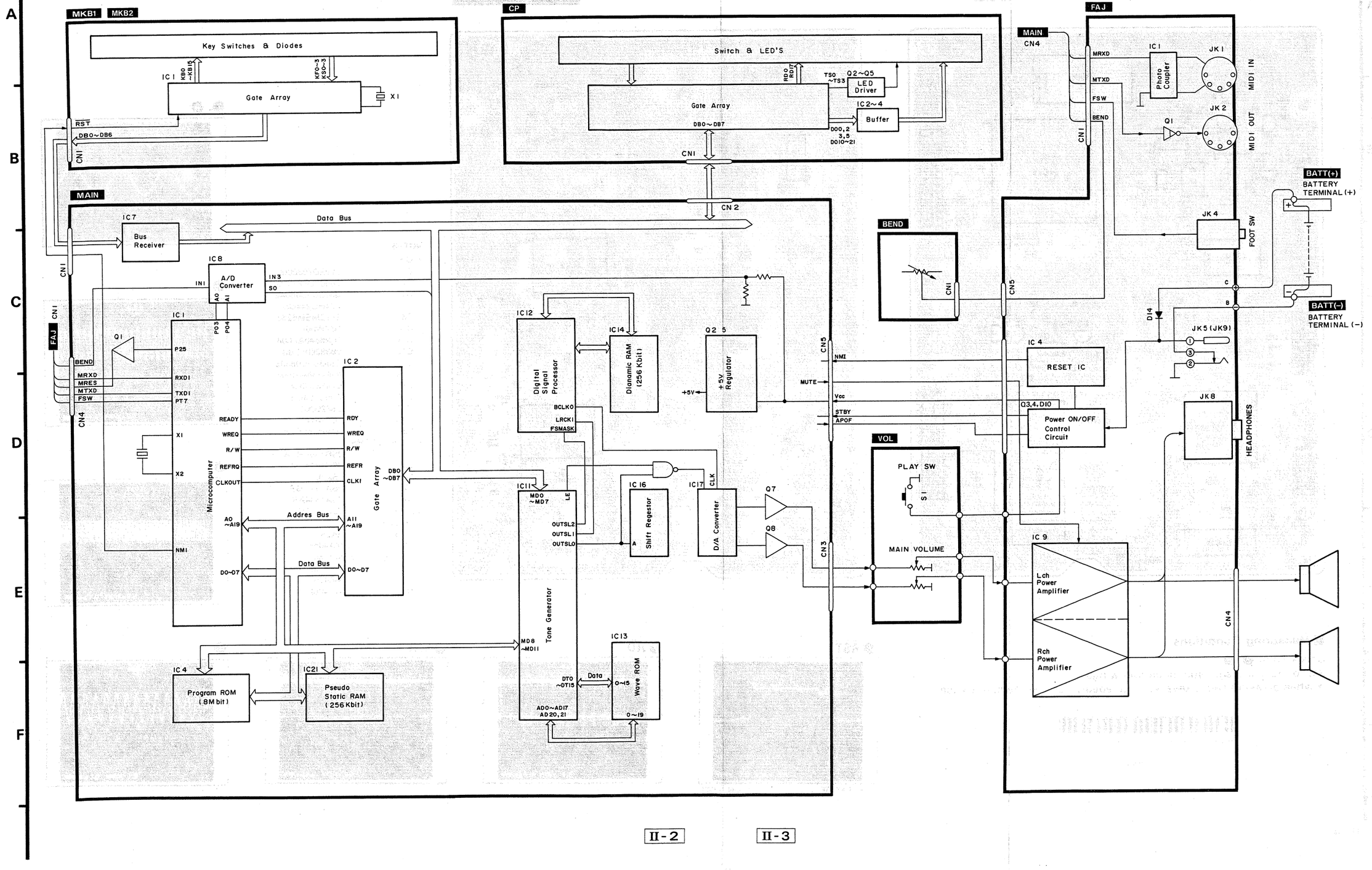


BLOCK DIAGRAM

1 2 3 4 5 6 7 8 9

A B C D E F

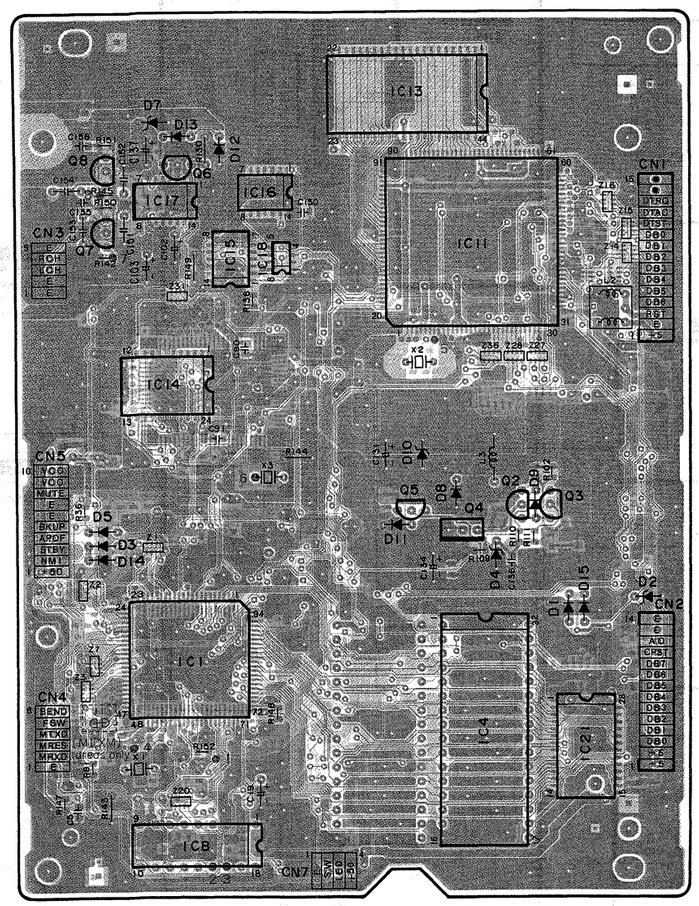
Tone Signals Control Signals



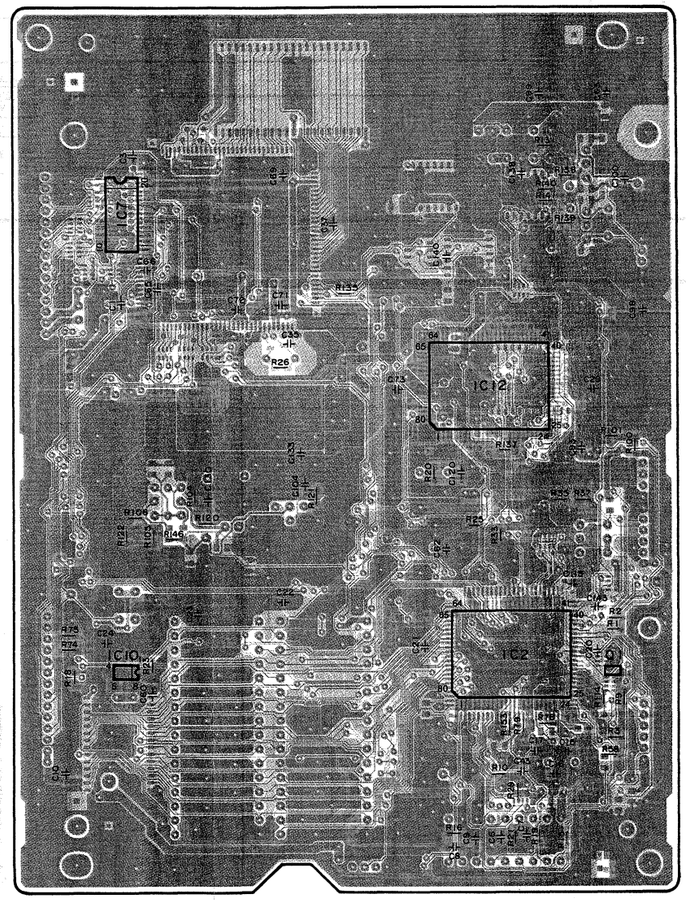
MAIN MAIN CIRCUIT BOARD

MAIN COMPONENT SIDE

Component Side
Foil Side



MAIN FOIL SIDE



• [M] [XM] areas **SXPG217121**
• Other areas **SXPG217111**

NOTES:

• IC'S

IC1:	SVIGD70320GJ
IC2:	D65012GF-A79
IC4:	QSIGU3C08042
IC7:	D74HC244GS
IC8:	SVIGMSM6253
IC10:	TC7W00F
IC11:	TC25540AF006
IC12:	D6382GF-3B9
IC13:	QSIGU3C08308
IC14:	MN41464AS-08
IC15:	D74HC00GS
IC16:	74HC164GS
IC17:	D63200GS
IC18:	TC7W04F
IC21:	HM65256BLF10

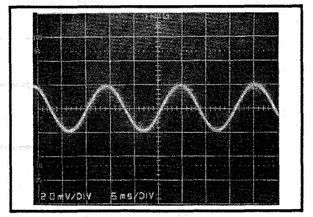
• TRANSISTORS

Q1:	2SB709ARTW
Q2, 3:	2SC1815GR
Q4:	2SA1643
Q5:	2SA1015-GR
Q6:	2SA1534AR
Q7, 8:	2SC1310G

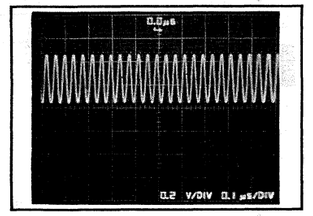
• DIODES

D1, 8:	EK04
D2:	MA4056
D3, 5, 9, 11~15:	MA165
D4:	MA4030
D7:	MA4051
D10:	MA4062

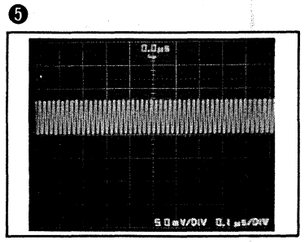
❼, ❽



❻



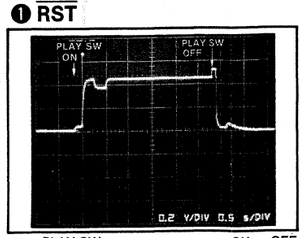
❺



■ Measuring Conditions

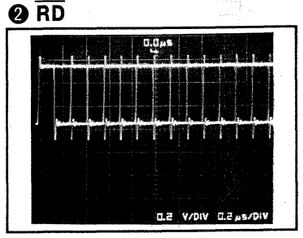
Check Point ❼, ❽
Set to the self-diagnostic mode followings.
• While pressing two E keys simultaneously, turn on the play switch.

❶ $\overline{RST}$

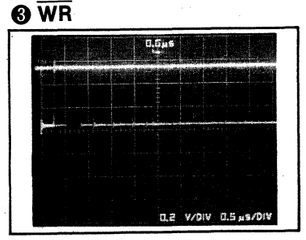


• PLAY SW. ..... ON → OFF

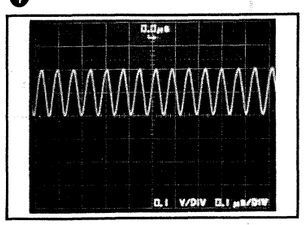
❷ $\overline{RD}$



❸ $\overline{WR}$

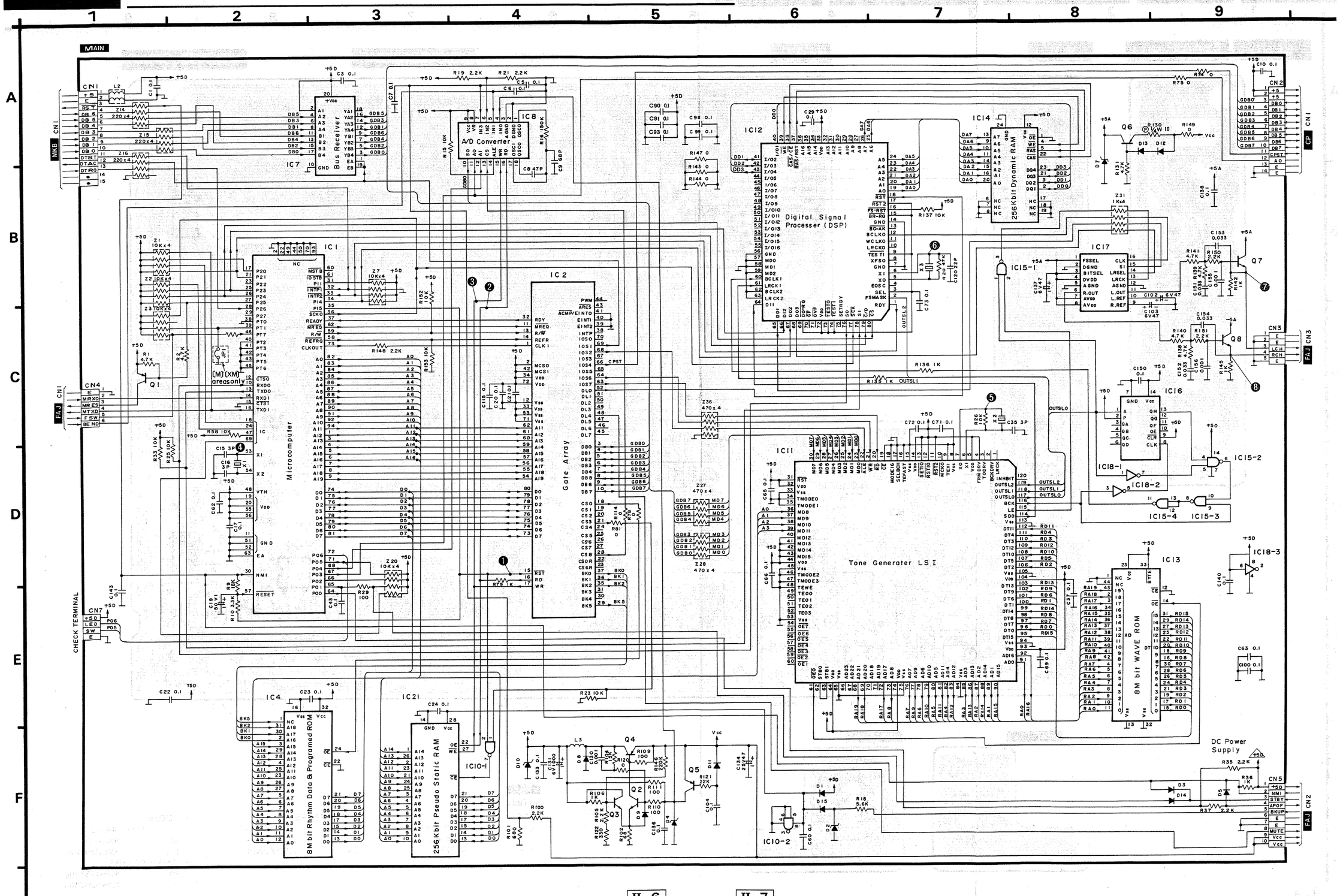


❹



MAIN

MAIN CIRCUIT DIAGRAM



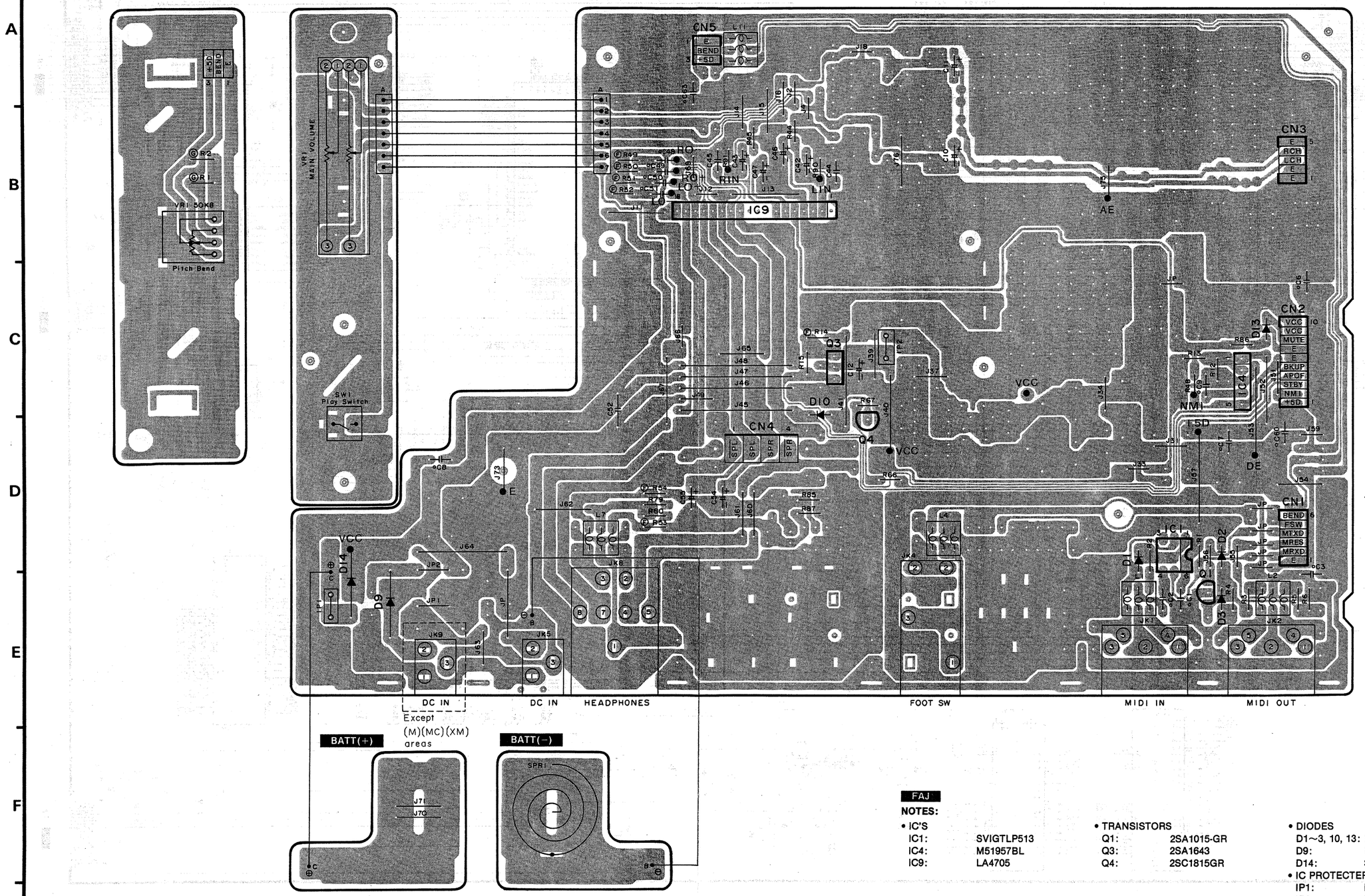
II-6 II-7

CIRCUIT BOARD

FAJ | VOL | BATT(−) | BATT(+) | BEND

BEND SXPG211911 VOL FAJ

• [M] [MC] [XM] areas SXPG216721 • Other areas SXPG216711



FAJ

NOTES:

• IC'S

IC1:	SVIGTLP513
IC4:	M51957BL
IC9:	LA4705

• TRANSISTORS

Q1:	2SA1015-GR
Q3:	2SA1643
Q4:	2SC1815GR

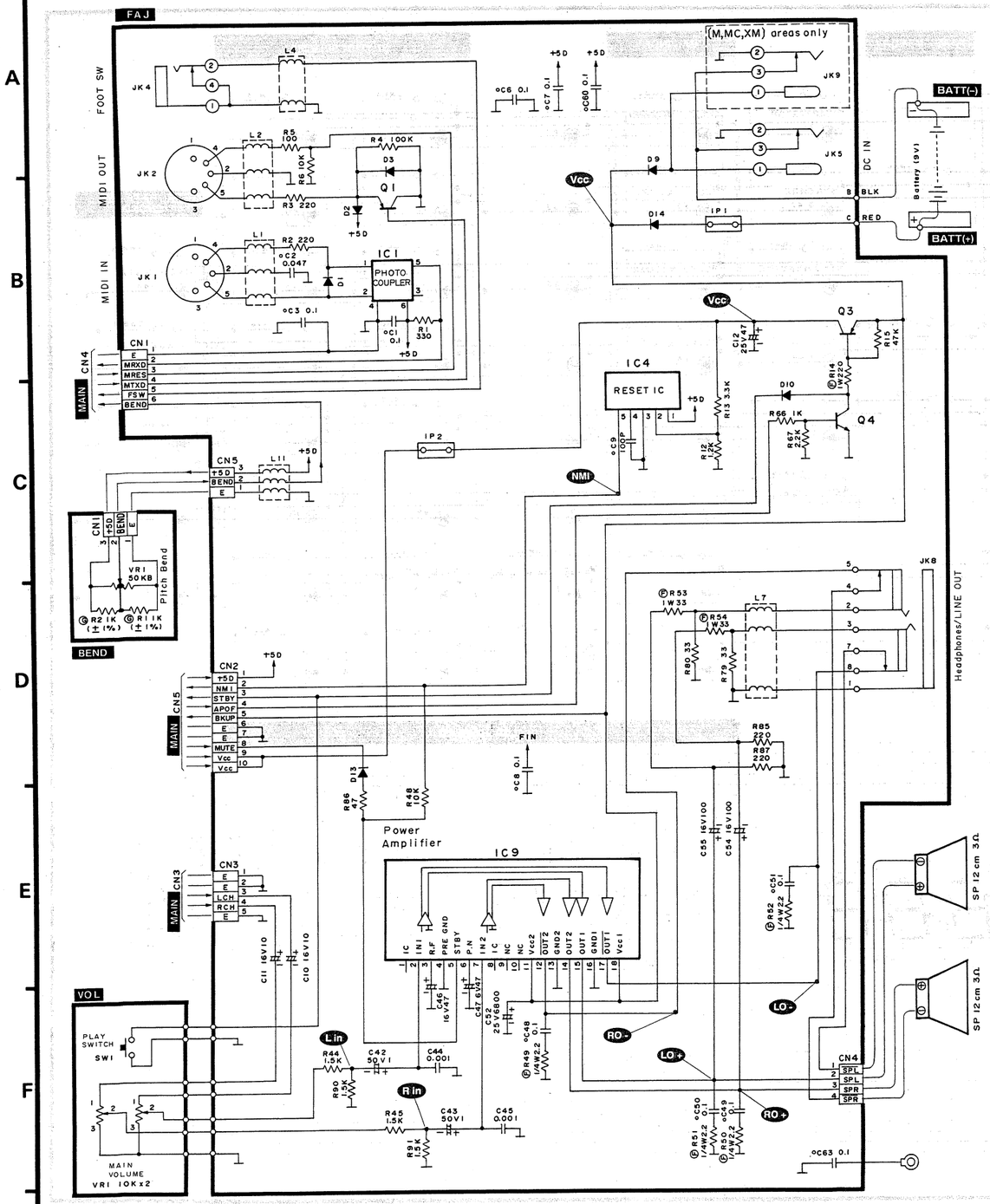
• DIODES

D1~3, 10, 13:	MA165
D9:	RK34LF
D14:	SVDGRK14S

• IC PROTECTERS

IP1:	ICP-N75T104
IP2:	ICP-N25T104

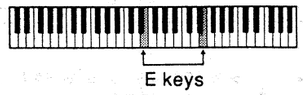
CIRCUIT DIAGRAM



■ Measuring Conditions

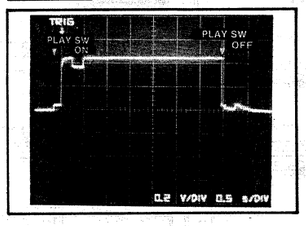
Set to the self-diagnostic mode followings.

- While pressing two E keys simultaneously, turn on the play switch.

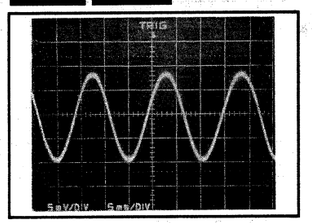


- Keyboard ..... C1 key

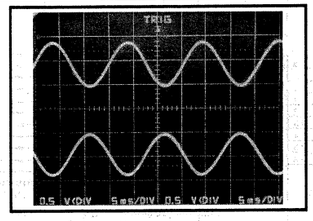
NMI



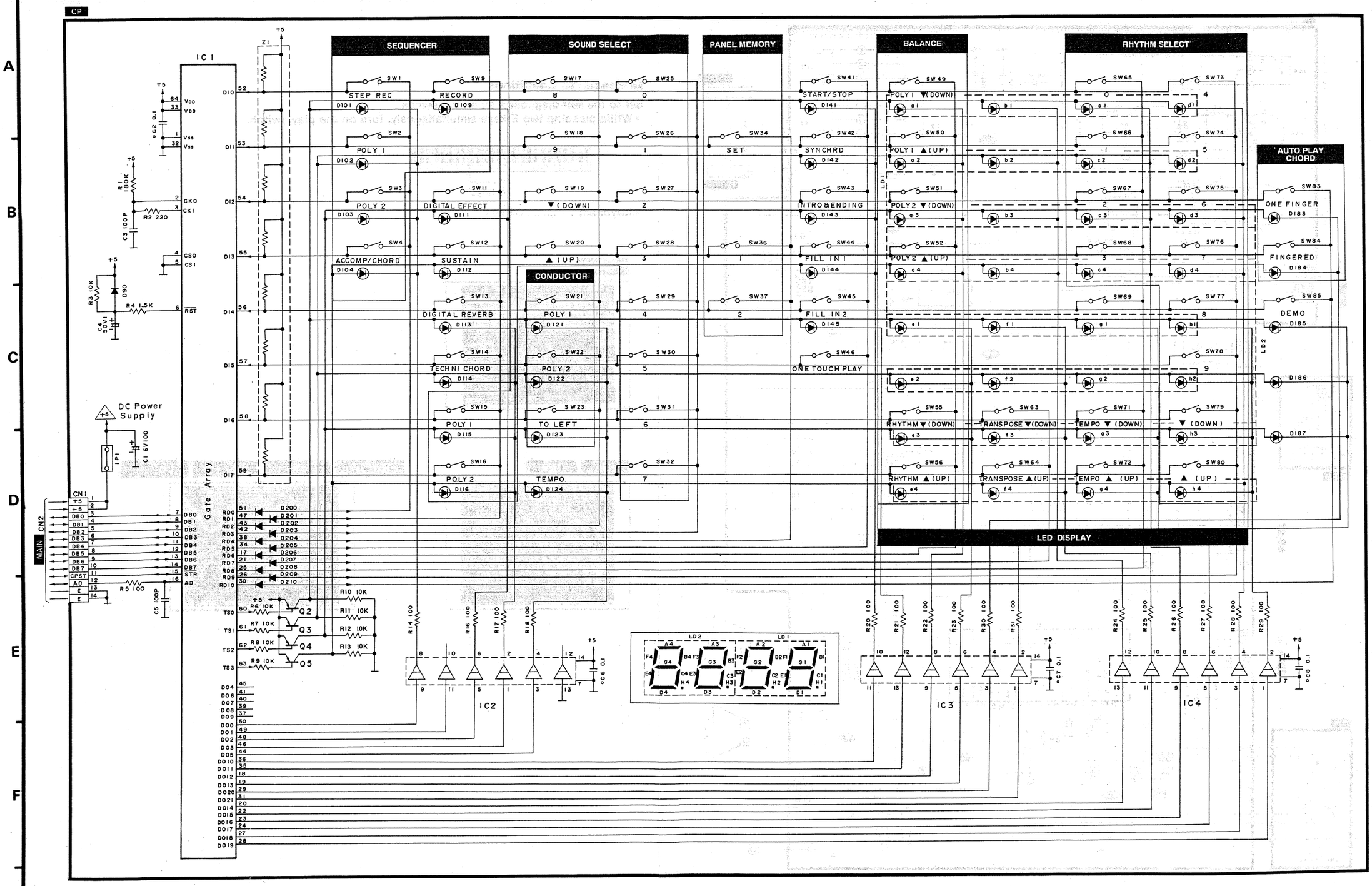
Lin **Rin**



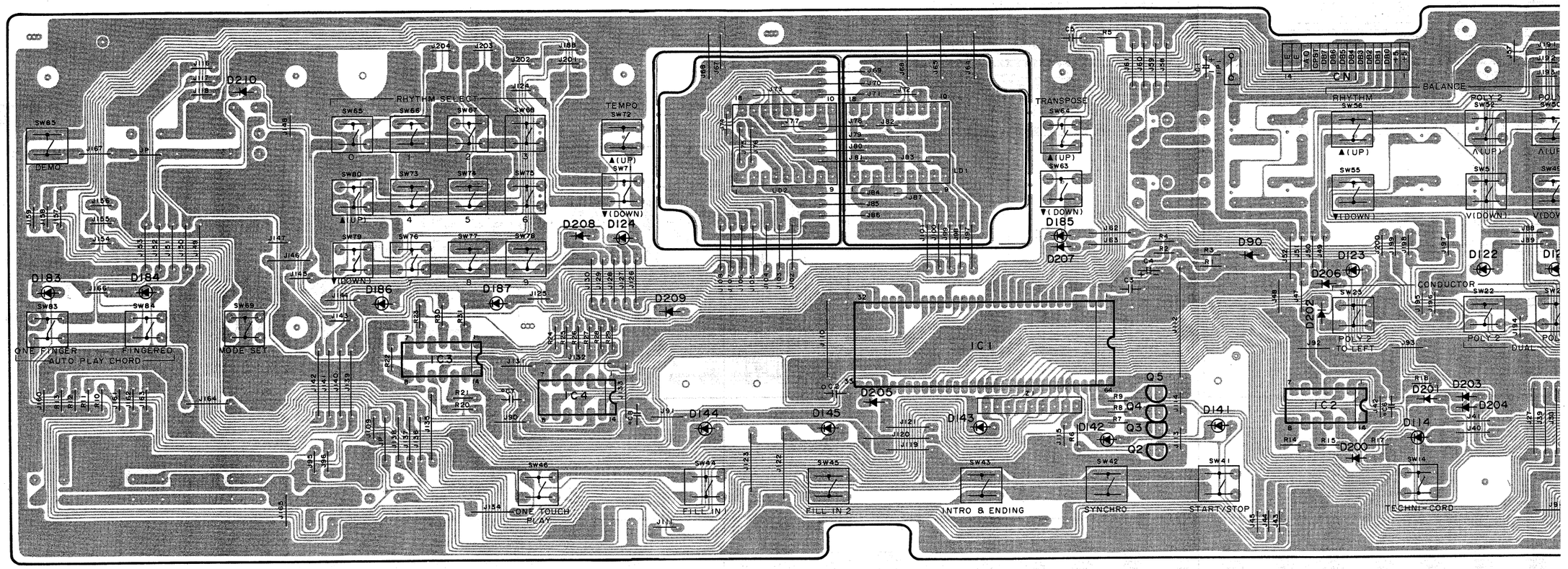
Ro(+) **Ro(−)** **Lo(+)** **Lo(−)**



CP CONTROL PANEL CIRCUIT DIAGRAM

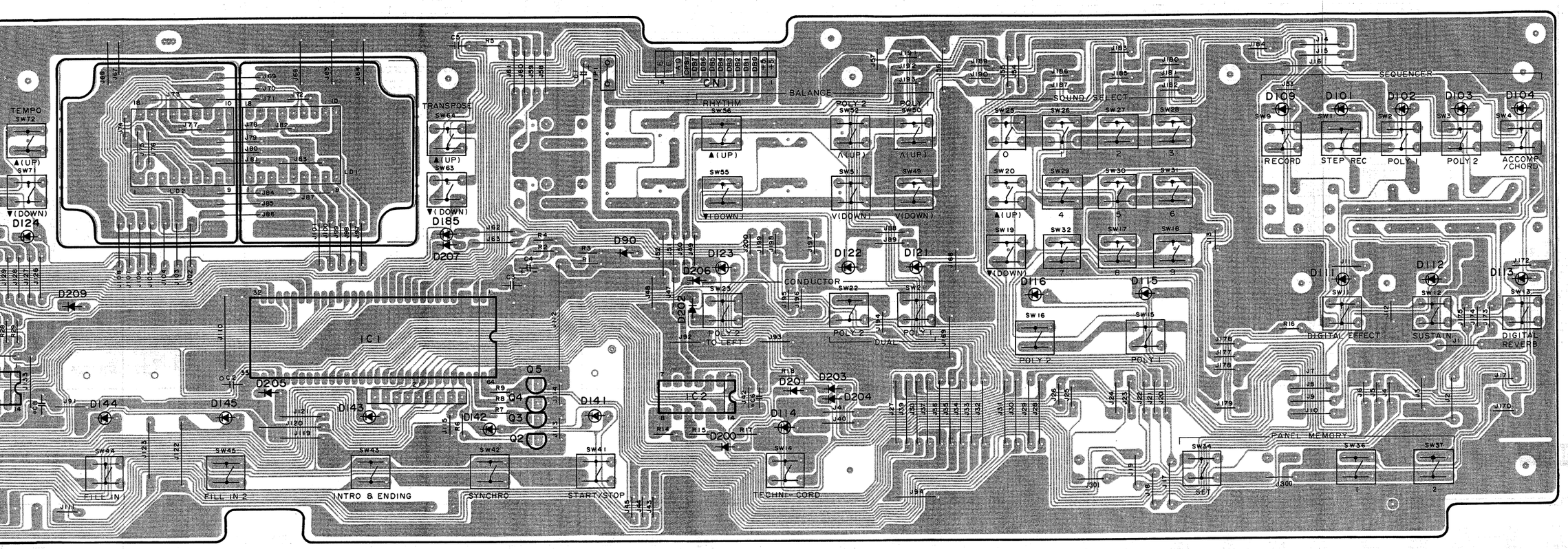


CP CONTROL PANEL CIRCUIT BOARD



NOTES:

- IC'S
  - IC1: SVIGM603A121
  - IC2~4: HD74LS07P
- TRANSISTORS
  - Q2~5: 2SA830SB
- DISPLAY
  - LD1, LD2: LB602VA2
- DIODES
  - D90, 200~210: MA165
  - D101~104, 109, 124, 185, 186: SEL4417GM
  - D111~116, 121~123, 141~145, 183, 184, 187: SEL4117RM
- IC PROTECTER
  - IP1: ICP-N10T104

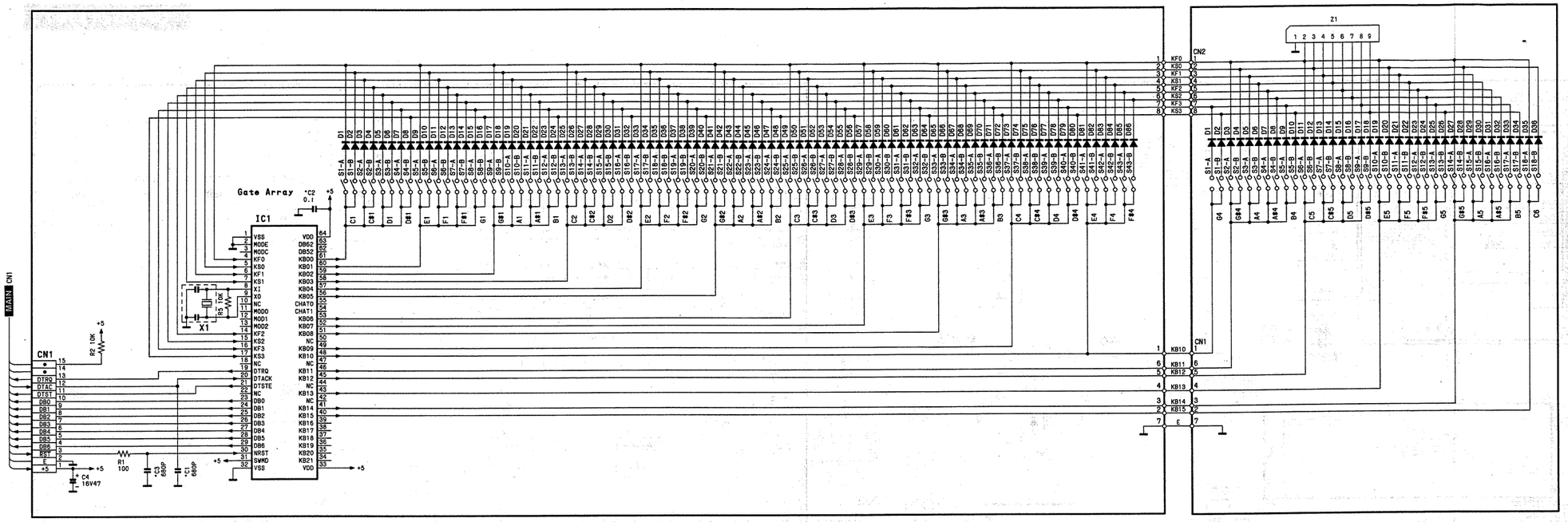


NOTES:

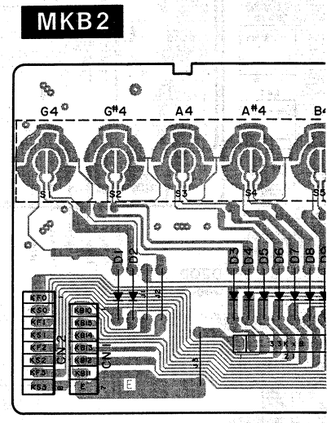
- IC'S
  - IC1: SVIGM603A121
  - IC2~4: HD74LS07P
- TRANSISTORS
  - Q2~5: 2SA830SB
- DISPLAY
  - LD1, LD2: LB602VA2
- DIODES
  - D90, 200~210: MA165
  - D101~104, 109, 124, 185, 186: SEL4417GM
  - D111~116, 121~123, 141~145, 183, 184, 187: SEL4117RM
- IC PROTECTER
  - IP1: ICP-N10T104

MKB1 MKB2 MANUAL KEYBOARD 1, 2 CIRCUIT DIAGRAM & CIRCUIT BOARD

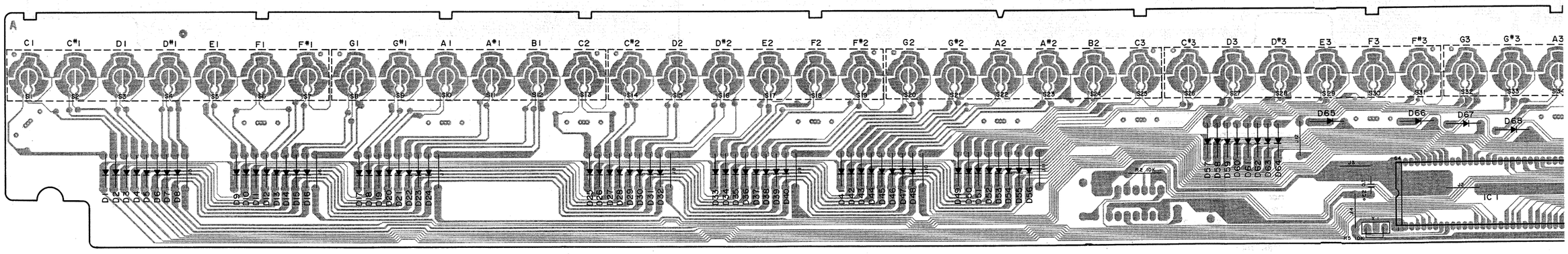
MKB1


Gate Array
IC1
X1
CN1
MAIN CN1
R1 100
R2 10K
R5 10K
C1 680P
C2 0.1
C3 680P
C4 16V47
VSS MODE MODC KF0 KS0 KF1 KS1 XI XO NC MODO MOD1 MOD2 KF2 KS2 KF3 KS3 NC DTRQ DTACK DTSTE NC DB0 DB1 DB2 DB3 DB4 DB5 DB6 NRST E SWMD VSS
VDD DB62 DB52 KB00 KB01 KB02 KB03 KB04 KB05 CHAT0 CHAT1 KB06 KB07 KB08 NC KB09 KB10 NC KB11 KB12 NC KB13 NC KB14 KB15 KB16 KB17 KB18 KB19 KB20 KB21 VDD
CN2
KF0 KS0 KF1 KS1 KF2 KS2 KF3 KS3
KB10 KB11 KB12 KB13 KB14 KB15 E
Z1

MKB2



MKB1



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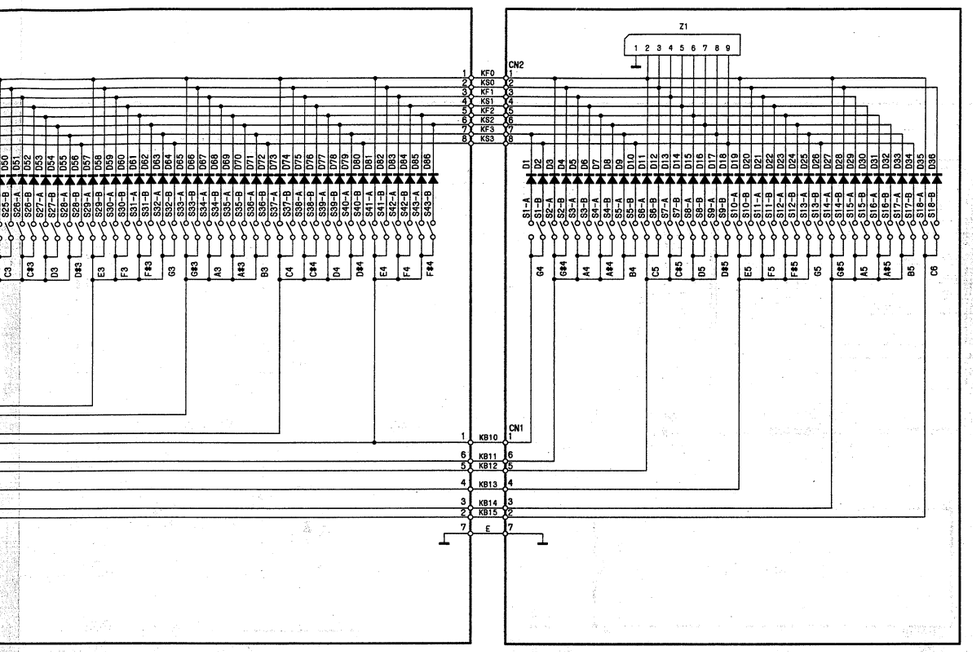
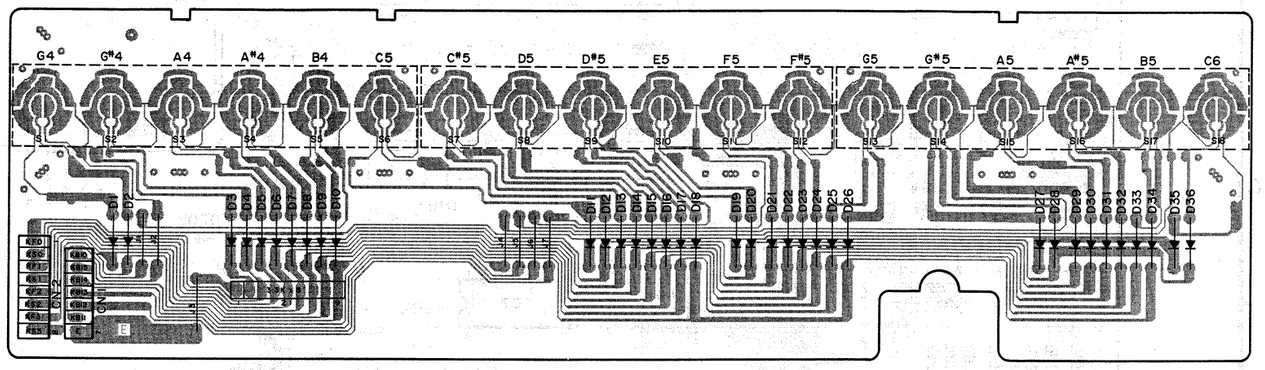
MKB2

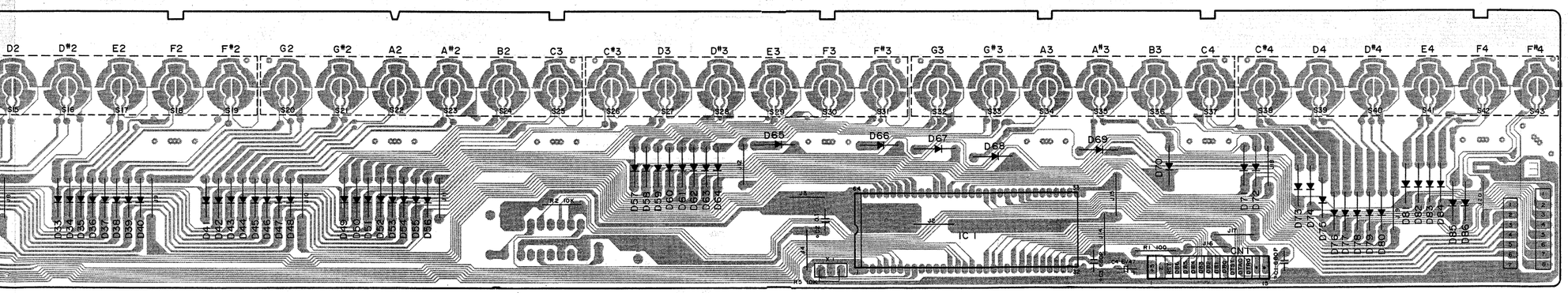


MKB2

SXPG143611



SXPG143531



NOTES:

MKB1

- IC
  IC1: D65022CW-285
- DIODES
  D1～86: MA162A

MKB2

- DIODES
  D1～36: MA162A

REPLACEMENT PARTS LIST.....P.C.B. and Wiring Parts

Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retension period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. ○ mark are new parts.
5. For part No. with area mark, check the area when placing an order.

■ PRINTED CIRCUIT BOARD

	RTL	Area	Part No.	Description	P/S
○	RTL	M XM areas	SXPG217121	MAIN	1
○	RTL	Other areas	SXPG217111	MAIN	1
○	RTL	M MC XM areas	SXPG216721	FAJ	1
○	RTL	Other areas	SXPG216711	FAJ	1
	RTL		SXPG211311B	BATT−	1
	RTL		SXPG211311C	BATT+	1
	RTL		SXPG211351D	VOL	1
	RTL		SXPG211911	BEND	1
○	RTL		SXPG211161	CP	1
	RTL		SXPG143531	MKB1	1
	RTL		SXPG143611	MKB2	1

MAIN MAIN CIRCUIT

	Ref. No.	Part No.	Description	P/S
	INTEGRATED CIRCUITS			
	IC1	SVIGD70320GJ	16 bit Microcomputer	1
	IC2	D65012GF-A79	Gate Array	1
○	IC4	QSIGU3C08042	8M bit Programmed ROM	1
○	IC7	D74HC244GS	3 State Buffers	1
	IC8	SVIGMSM6253	A/D Converter	1
	IC10	TC7W00F	Dual 2-input NAND Gates	1
	IC11	TC25540AF006	Tone Generator LSI	1
	IC12	D6382GF-3B9	Digital Signal Processor	1
○	IC13	QSIGU3C08308	8M bit WAVE ROM	1
	IC14	MN41464AS-08	256K bit Dynamic RAM	1
	IC15	D74HC00GS	Quad 2-input NAND GATES	1
	IC16	D74HC164GS	Shift Resister	1
○	IC17	D63200GS	D/A Converter	1
○	IC18	TC7W04F	Inverter	1
	IC21	HM65256BLF10	256K bit Pseudo Static RAM	1
	TRANSISTORS			
	Q1	2SB709ARTW	Transistor	1
S	Q2, 3	2SC1815GR	Transistor	2
	Q4	2SA1643	Transistor	2
S	Q5	2SA1015-GR	2SA933STRS (SUB. Part)	1
	Q6	2SA1534AR	Transistor	1
○	Q7, 8	2SC1310G	Transister	2
	DIODES			
	D1, 8	EK04	Diode	2
	D2	MA4056	Zener, 5.6V	1
	D3, 5, 9, 11～15	MA165	Diode	7
○	D4	MA4030	Zener, 3.0V	1
	D7	MA4051	Zener, 5.1V	1
	D10	MA4062	Zener, 6.2V	1

	Ref. No.	Part No.	Description	P/S
	OSCILLATORS			
○	X1	QSXG2F1400A	14MHz, Ceramic Oscillator	1
	X2	QSXG1A4915A	49.152MHz, Quartz Oscillator	1
	X3	QSXG2F2500A	25MHz, Ceramic Oscillator	1
	COMPONENT COMBINATIONS			
	Z1～3, 7, 20	EXBV8V103J	10kΩ×4	5
	Z14～16	EXBV8V221J	220Ω×4	3
	Z27, 28, 36	EXBV8V471J	470Ω×4	3
	Z31	EXBV8V102J	1kΩ×4	1
	COILS			
	L2	QLQGT2T150SA	Coil	1
	L3	QLCGTJR10KA	Coil	1
	RESISTORS			
	R1, 2	ERJ6GEYJ472V	4.7kΩ	2
	R3	ERJ6GEYJ102V	1kΩ	1
	R9	ERJ6GEYJ183V	18kΩ	1
	R10	ERJ6GEYJ332V	3.3kΩ	1
	R15	ERJ6GEYJ103V	10kΩ	1
	R16	ERJ6GEYJ154V	150kΩ	1
	R18	ERJ6GEYJ562V	5.6kΩ	1
	R19	ERJ6GEYJ222V	2.2kΩ	1
	R20	ERJ6GEYJ473V	47kΩ	1
	R21	ERJ6GEYJ222V	2.2kΩ	1
	R23	ERJ6GEYJ103V	10kΩ	1
	R25, 26	ERJ6GEYJ103V	10kΩ	2
	R29	ERJ6GEYJ101V	100Ω	1
	R33	ERJ6GEYJ103V	10kΩ	1
	R35	ERJ6GEYJ222V	2.2kΩ	1
	R36	ERJ6GEYJ102V	1kΩ	1
	R37	ERJ6GEYJ222V	2.2kΩ	1
	R58	ERJ6GEYJ103V	10kΩ	1
	R74, 75	ERJ6GEY0R00V	0Ω	2
	R78	ERJ6GEY0R00V	0Ω	1
	R79	ERJ6GEYJ102V	1kΩ	1
	R81	ERJ6GEY0R00V	0Ω	1
	R100	ERJ6GEYJ222V	2.2kΩ	1
○	R101	ERJ6GEYJ681V	680Ω	1
○	R102	ERJ6GEYJ680V	68Ω	1
	R104	ERJ6GEYJ153V	15kΩ	1
	R105	ERJ6GEYJ222V	2.2kΩ	1
	R106	ERJ6GEYJ102V	1kΩ	1
	R109～111	ERJ6GEYJ101V	100Ω	3
	R114	ERJ6GEY0R00V	0Ω	1
	R120	ERJ6GEY0R00V	0Ω	1
○	R121	ERJ6GEYJ223V	22kΩ	1
	R122	ERJ6GEYJ331V	330Ω	1
	R130 ⚠	ERD2FCVG100	10Ω, 1/4W, Fuse Type	1
	R131	ERJ6GEYJ472V	4.7kΩ	1

CP CONTROL PANEL CIRCUIT

Ref. No.	Part No.	Description	P/S
R135, 136	ERJ6GEYJ102V	1kΩ	2
R137	ERJ6GEYJ103V	10kΩ	1
R138~141	ERJ6GEYJ472V	4.7kΩ	4
R142	ERJ6GEYJ102V	1kΩ	1
R143, 144	ERDS2T0	0Ω, 1/4W	2
R145	ERJ6GEYJ102V	1kΩ	1
R146	ERJ6GEYJ224V	220kΩ	1
R147	ERJ6GEY0R00V	0Ω	1
R148	ERJ6GEYJ222V	2.2kΩ	1
R149	ERDS2T0	0Ω, 1/4W	1
R150, 151	ERJ6GEYJ222V	2.2kΩ	2
R152	ERJ6GEYJ103V	10kΩ	1
R153	ERJ6GEYJ103V	10kΩ	1
CAPACITORS			
C1	ECUV1H104ZFX	0.1μF	1
C3	ECUV1H104ZFX	0.1μF	1
C5~7	ECUV1H104ZFX	0.1μF	3
C8	ECUV1H470JG	47pF	1
C9	ECUV1H680JG	68pF	1
C10	ECUV1H104ZFX	0.1μF	1
C15, 16	ECUV1H030CCN	3pF	2
C17	ECUV1H104ZFX	0.1μF	1
C19	ECEA1HKA010	1μF, 50V	1
C20	ECUV1H104ZFX	0.1μF	1
C21	ECUV1H104ZFX	0.1μF	1
C22	ECUV1H104ZFX	0.1μF	1
C23	ECUV1H104ZFX	0.1μF	1
C24	ECUV1H104ZFX	0.1μF	1
C29	ECUV1H104ZFX	0.1μF	1
C35	ECUV1H030CCN	3pF	2
C37	ECUV1H104ZFX	0.1μF	1
C43	ECUV1H104ZFX	0.1μF	1
C60	ECUV1H104ZFX	0.1μF	1
C62, 63	ECUV1H104ZFX	0.1μF	2
C65, 66, 69	ECUV1H104ZFX	0.1μF	3
C71~73	ECUV1H104ZFX	0.1μF	3
C90	ECUV1H104ZFX	0.1μF	1
C91	ECUV1H104ZFX	0.1μF	1
C93	ECUV1H104ZFX	0.1μF	1
C98	ECUV1H104ZFX	0.1μF	1
C99	ECUV1H104ZFX	0.1μF	1
C100	ECUV1H104ZFX	0.1μF	1
C102, 103	ECEA0JKA470	47μF, 6.3V	2
C104	ECUV1H104ZFX	0.1μF	1
C115	ECUV1H104ZFX	0.1μF	1
○ C120	ECUV1H220JCN	22pF	1
C130	ECUV1H102JX	0.001μF	1
C131	ECEA0JU102	1000μF, 6.3V	1
C133	ECUV1H104ZFX	0.1μF	1
C134	ECEA1EKA470	47μF, 25V	1
C136	ECUV1H104ZFX	0.1μF	1
C137	ECEA0JKA470	47μF, 6.3V	1
C138	ECUV1H104ZFX	0.1μF	1
C140	ECUV1H104ZFX	0.1μF	1
C143	ECUV1H104ZFX	0.1μF	1
C150	ECUV1H104ZFX	0.1μF	1
C151~154	ECQB1H333JF	0.033μF	4
C155, 156	ECUV1H102JX	0.001μF	2

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUITS			
IC1	SVIGM603A121	Gate Array	1
IC2~4	HD74LS07P	Hex Buffers	3
TRANSISTORS			
Q2~5	2SA830SB	Transistor	4
DIODES			
D90, 200~210	MA165	Diode	12
D101~104, 109, 124, 185, 186	SEL4417GM	LED (GREEN)	8
D111~116, 121~123, 141~145, 183, 184, 187	SEL4117RM	LED (RED)	17
DISPLAYS			
LD1, 2	LB602VA2	Dual 8 Segments Display	2
COMPONENT COMBINATION			
Z1	EXBPI8103JM	10kΩ×8	1
SWITCHES			
S1~4, 9, 11~23, 25~32, 34, 36, 37, 41~46, 49~52, 55, 56, 63~69, 71~80, 83~85	SSHG1049A	Push Switch	61
IC PROTECTOR			
IP1 ⚠	ICP-N10T104	IC Protector	1
RESISTORS			
R1	ERDS2TJ184	180kΩ	1
R2	ERDS2TJ221	220Ω	1
R3	ERDS2TJ103	10kΩ	1
R4	ERDS2TJ152	1.5kΩ	1
R5	ERDS2TJ101	100Ω	1
R6~13	ERDS2TJ103	10kΩ	8
R14, 15	ERDS2TJ101	100Ω	2
R16~18	ERDS2TJ101	100Ω	3
R20~29	ERDS2TJ101	100Ω	10
R30, 31	ERDS2TJ101	100Ω	2
CAPACITORS			
C1	ECEA0JKA101	100μF, 6.3V	1
C2	ECRF1H104ZF	0.1μF	1
C3	ECBA1H101KB	100pF	1
C4	ECEA1HKA010	1μF, 50V	1
C5	ECBA1H101KB	100pF	1
C6~8	ECRF1H104ZF	0.1μF	3

FAJ FILTER & AMP CIRCUIT

	Ref. No.	Part No.	Description	P/S
	INTEGRATED CIRCUITS			
	IC1	SVIGTLP513	Photo Coupler	1
	IC4	M51957BL	Reset IC	1
	IC9	LA4705	Power Amplifier	1
	TRANSISTORS			
S	Q1	2SA1015-GR	2SA933STRS (SUB. Part)	1
	Q3	2SA1643	Transistor	1
S	Q4	2SC1815GR	Transistor	1
	DIODES			
	D1~3, 10, 13	MA165	Diode	5
	D9	RK34LF	Diode	1
	D14	SVDGRK14S	Diode	1
	COILS			
	L1, 2, 7, 11	QLQGT3T150SA	Coil	4
	L4	QLQGT2T150SA	Coil	1
	JACKS			
	JK1, 2	SJSG1370A	MIDI IN, OUT	2
	JK4	QJJG003AA	FOOT SW	1
	JK5	QJSG006AA	JACK (DC IN)	1
	JK8	SJJG100A	HEAD PHONE	1
	JK9	SJJG440A	JACK (DC IN), except M MC XM	1
	IC PROTECTORS			
	IP1	ICP-N75T104	IC Protecter	1
⚠	IP2	ICP-N25T104	IC Protector	1
	RESISTORS			
	R1	ERDS2TJ331	330Ω	1
	R2, 3	ERDS2TJ221	220Ω	2
	R4	ERDS2TJ104	100kΩ	1
	R5	ERDS2TJ101	100Ω	1
	R6	ERDS2TJ103	10kΩ	1
	R12	ERDS2TJ122	1.2kΩ	1
	R13	ERDS2TJ332	3.3kΩ	1
⚠	R14	ERG1SJ221	220Ω, 1W	1
	R15	ERDS2TJ473	47kΩ	1
	R44, 45	ERDS2TJ152	1.5kΩ	2
	R48	ERDS2TJ103	10kΩ	1
⚠	R49~52	ERD25FVJ2R2	2.2Ω, 1/4W, Flame-Ploof	4
○	R53, 54	ERG1SJ330	33Ω, 1W	2
	R66	ERDS2TJ102	1kΩ	1
	R67	ERDS2TJ222	2.2kΩ	1
	R79, 80	ERDS2TJ330	33Ω	2
	R85	ERDS2TJ221	220Ω	1
	R86	ERDS2TJ470	47Ω	1
	R87	ERDS2TJ221	220Ω	1
	R90, 91	ERDS2TJ152	1.5kΩ	2
	CAPACITORS			
	C1	ECRF1H104ZF	0.1µF	1
	C2	ECKF1E473ZV	0.047µF	1
	C3	ECRF1H104ZF	0.1µF	1
	C6~8	ECRF1H104ZF	0.1µF	3
	C9	ECCF1H101J	100pF	1
	C10, 11	ECEA1CKA100	10µF, 16V	2
	C12	ECEA1EKA470	47µF, 25V	1
	C42, 43	ECEA1HKA010	1µF, 50V	2

	Ref. No.	Part No.	Description	P/S
	C44	ECQG1H102KZ	0.001µF	1
	C45	ECQG1H102KZ	0.001µF	1
	C46	ECEA1CKA470	47µF, 16V	1
	C47	ECEA0JKA470	47µF, 6.3V	1
	C48~51	ECRF1H104ZF	0.1µF	4
	C52	ECA1EM682E	6800µF, 25V	1
	C54, 55	ECEA1CKA101	100µF, 16V	2
	C60, 63	ECRF1H104ZF	0.1µF	2

VOL MAIN VOLUME CIRCUIT

	Ref. No.	Part No.	Description	P/S
	SWITCH			
	S1	QSPG1005AA	Push Switch	1
	VARIABLE RESISTOR			
○	VR1	QRVG30P02A14	10kΩ, A	1

BATT – BATTERY – CIRCUIT

	Ref. No.	Part No.	Description	P/S
	SPRING			
	SPR1	SJCG20A	Spring	1

BEND PITCH BEND CIRCUIT

	Ref. No.	Part No.	Description	P/S
	VARIABLE RESISTOR			
	VR1	QRVG16A02B54	50kΩ, B	1
	RESISTORS			
	R1, 2	ER0S2CKF1001	1kΩ, ±1%	2

MKB1 MANUAL KEYBOARD 1 CIRCUIT

	Ref. No.	Part No.	Description	P/S
	INTEGRATED CIRCUIT			
	IC1	MN50020PGV	Gate Array	1
	DIODES			
S	D1~87	MA162A	MA150IR (SUB. Part)	87

	Ref. No.	Part No.	Description	P/S
	OSCILLATOR			
	X1	EF0G08004A5	8MHz, Ceramic Oscillator	1
	SWITCHES			
	S1~7	SSPG7004A	Rubber Switch (7 pcs. on one)	7
	S8~43	SSPG6004A	Rubber Switch (6 pcs. on one)	36
	RESISTORS			
	R1	ERDS2TJ101	100Ω	1
	R2	ERDS2TJ103	10kΩ	1
	R5	ERDS2TJ103	10kΩ	1
	CAPACITORS			
	C1	ECCF1H681J	680pF	1
	C2	ECRF1H104ZF	0.1µF	1
	C3	ECCF1H681J	680pF	1
	C4	ECEA0JU470	47µF, 6.3V	1

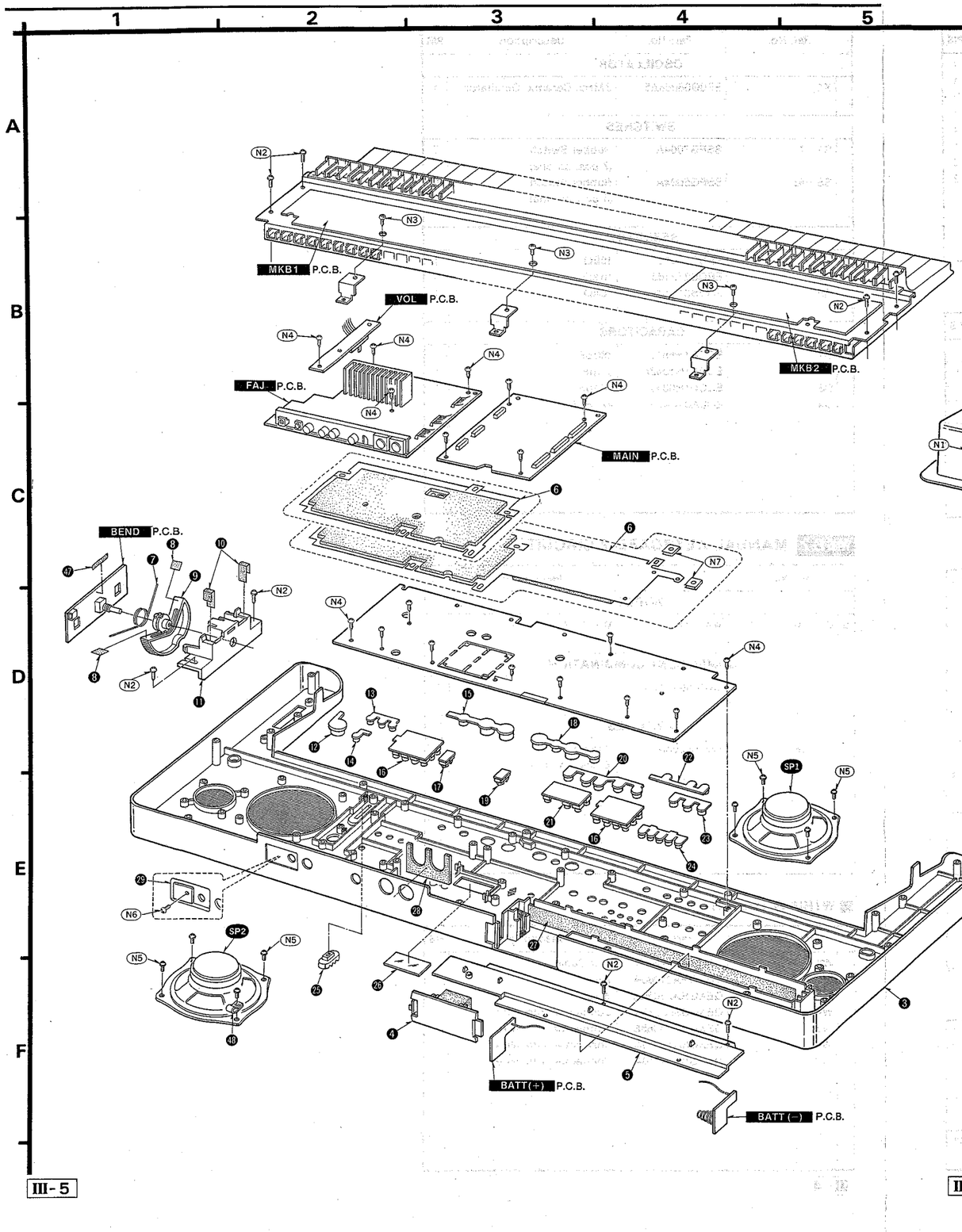
MKB2 MANUAL KEYBOARD 2 CIRCUIT

	Ref. No.	Part No.	Description	P/S
	DIODES			
S	D1~36	MA162A	MA150IR (SUB. Part)	36
	COMPONENT COMBINATION			
	Z1	EXBP88332JM	3.3kΩ×8	1
	SWITCHES			
	S1~18	SSPG6004A	Rubber Switch (6 pcs. on one)	18

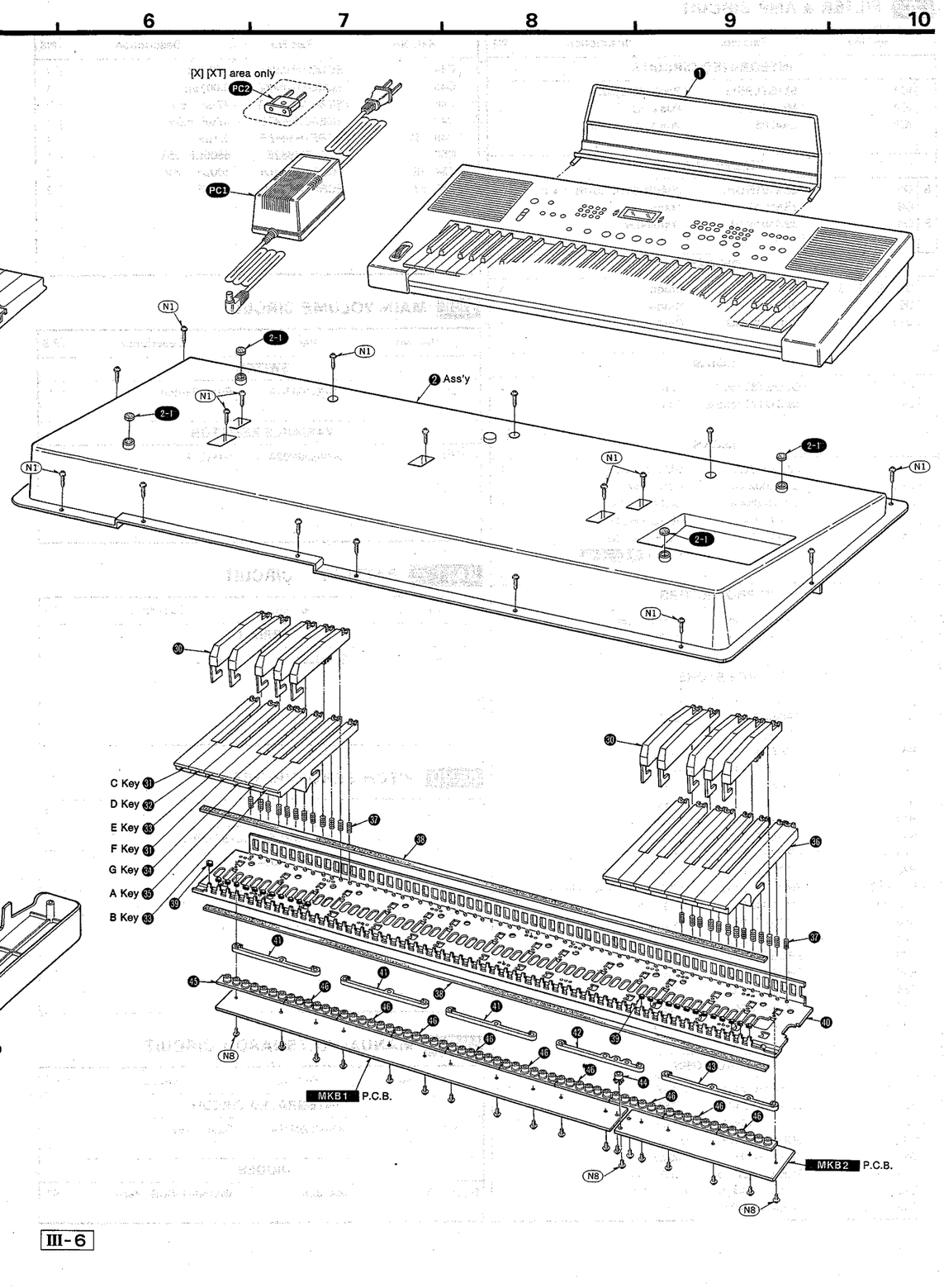
■ WIRING PARTS

	Ref. No.	Part No.	Description	P/S
	W1	QEUGK7H08BB	Flat Cable	1
	W2	QEXGRA01080A	Wire	1
	W3	QEXGRA01050A	Wire	1
	W4	QEXGSS03035A	Connector with Wire	1
	W5	QEXGVH04065B	Connector with Wire	1
	W6	QEXGSS15015A	Connector with Wire	1
	W7	QEXGSS14010A	Connector with Wire	1

CABINET PARTS LOCATION



III-5



III-6

REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

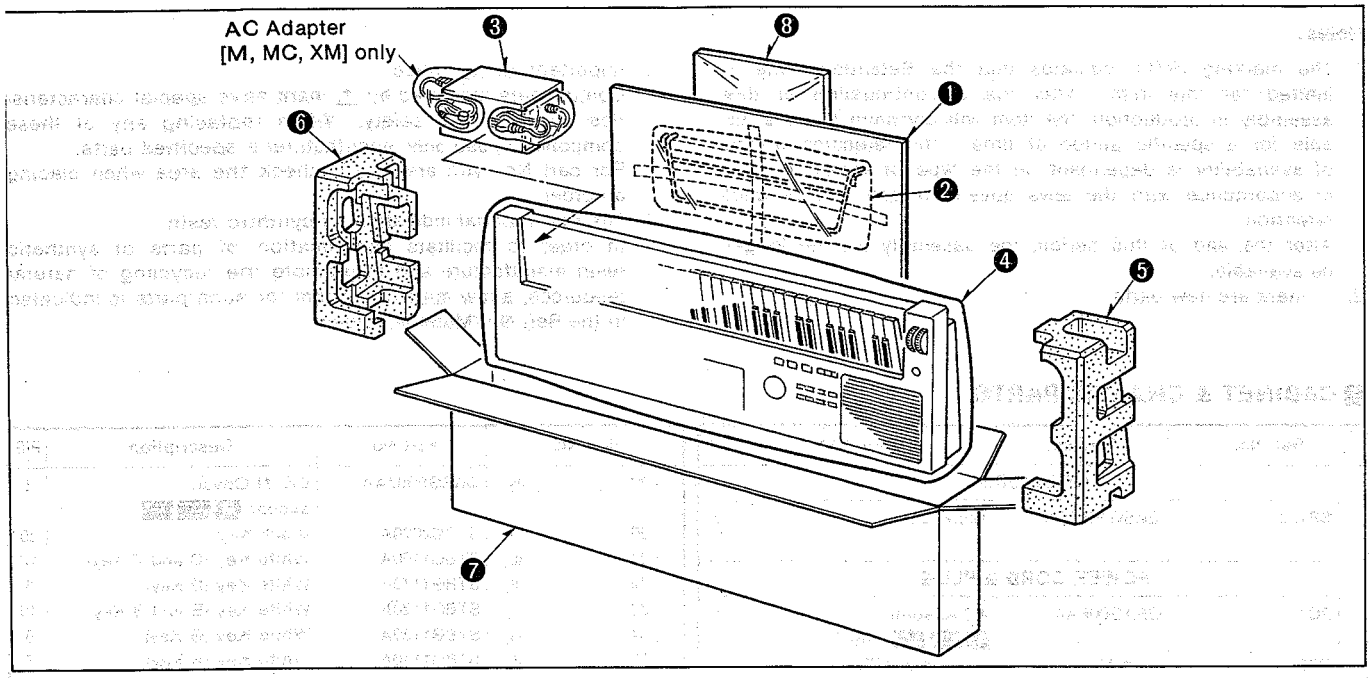
Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retension period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. ○ mark are new parts.
3. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
4. For part No. with area mark, check the area when placing an order.
5. The raw material indication for synthtic resin
   In order to facilitate classification of parts of synthetic resin manufacture and to promote the recycling of natural resources, a raw material symbol for such parts is indicated in the Ref. No./Material column.

■ CABINET & CHASSIS PARTS

	Ref. No.		Part No.	Description	P/S
			SPEAKERS		
	SP1, 2		QASG12P03A	12cm, 3Ω	2
			POWER CORD & PLUG		
	PC1		QFAG006AA	AC Adapter, M MC XM only	1
	PC2	⚠	SJP5213-1	Attachment Plug, X XT only	1
			CABINET PARTS		
	1		QYAG3001AA	Music Rack	1
○	2	PS	QYKG097AN	Bottom Case Ass'y, M MC XM	1
○	2	PS	QYKG097AM	Bottom Case Ass'y, Others	1
○	2	PS	QYKG097AP	Bottom Case Ass'y, EK X XR XS XL XD XT	1
	2-1		SHGG3130A	Foot Rubber	4
○	3	PS	QYPG1019GA	Control Panel, M MC XM	1
○	3	PS	QYPG1019FA	Control Panel, except M MC XM	1
	4	PS	QKSGF009AB	Battery Cover	1
	5	PS	QKSGF010AA	Battery Cover	1
○	6	PVC	QSCG042C	Shield, except M MC XM	1
○	6	PVC	QSCG061A	Shield, M MC XM	1
	7		SUSG570A	Spring	1
	8		QMFG4076AA	Felt	2
	9	ABS	SBNG4050A	Wheel Knob	1
	10		QMFG4083AA	Felt	2
	11	PS	QMQG0016AA	Bender Case	1
	12		QGUG1160AB	Button	1
	13		QGUG1162AB	Button	1
○	14		QGUG1161BB	Button	1
○	15		QGUG1166BB	Button	1
	16		QGUG1164AA01	Button	2
	17		QGUG1173AB	Button	1
	18		QGUG1167AB	Button	1
○	19		QGUG1165BB	Button	1
	20		QGUG1170AB	Button	1
○	21		QGUG1172BC	Button	1
○	22		QGUG1169BC	Button	1
	23		QGUG1171AB	Button	1
○	24		QGUG1168AD	Button	1
	25	ABS	SBNG7070B	Knob, Main Volume	1
	26	PVC	QKWG007AB	Display Plate	1
	27		QMFG4075AA	Felt	1
	28		QMRG5022AA	Air Shield Packing	1
	29	PS	QKSGF007AA	DC IN Cover, except M MC XM	1
	30	AS	STBG2070A	Black Key	25
	31	AS	STBG1100A	White Key (C and F Key)	10
	32	AS	STBG1110A	White Key (D Key)	5
	33	AS	STBG1120A	White Key (E and B Key)	10
	34	AS	STBG1130A	White Key (G Key)	5
	35	AS	STBG1140A	White Key (A Key)	5
	36	AS	STBG1150A	White Key (Top Octave C Key)	1
	37		SUSG271A	Spring	61
	38		SHSG1970A	Felt	2
	39		SHGG9052A	Key Guide Rubber	61
	40		STBG6241A	Chassis	1
	41	PS	SHRGA9010A	Spacer	3
	42	PP	SHRG9760A	P.C.B. Holder	1
	43	PS	SHRGA9020A	Spacer	1
	44	PS	SHRGA9030A	Spacer	1
	45		SSPG7004A	Rubber Switch (7 pcs. on one)	1
	46		SSPG6004A	Rubber Switch (6 pcs. on one)	9
	47		QMFG4082AA	Felt	1
	48		SHRG1230A	Cord Clamper	1
			SCREWS & WASHERS		
	N1		XTW3+14TFZ	Screw	18
	N2		XTW3+12Q	Screw	8
	N3		XTB3+5C	Screw	3
	N4		XTV3+10G	Screw	18
	N5		XTW3+10Q	Screw	8
	N6		XTB3+14JFZ	Screw, M MC XM	1
	N7		SNEG2620A	Speed Nut, M MC XM	2
	N8		XTW3+10T	Screw	19

PACKING



PACKING PARTS

	Ref. No.		Part No.	Description	P/S
	1		QPGG0195AA	Card Board	1
	2		SPHG1770A	Polyethylene Bag	1
	3		QPGG0196AA	Pad, AC Adapter M MC XM	1
	4	PE	SPHG1750A	Polyethylene Bag	1
	5	PS	QPNG0319AA	Pad, Left	1
	6	PS	QPNG0320AA	Pad, Right	1
○	7		QPGG0194AF	Carton	1
				OPERATING INSTRUCTION MANUAL	
○	8		QQFGKN470AA	Operating Instruction Manual, EN	1
○	8-1		QQTG0119A	NORSK	1
○	8-2		QQTG0201A	NORSK	1
○	8-3		QQTG0120A	SVENSKA	1
○	8-4		QQTG0202A	SVENSKA	1
○	8-5		QQTG0121A	DANSK	1
○	8-6		QQTG0203A	DANSK	1
○	8-7		QQTG0122A	SUOMI	1
○	8-8		QQTG0204A	SUOMI	1
○	8		QQFGKN470BA	Operating Instruction Manual, M	1
○	8-1		QQTG0125A	ENGLISH	1
○	8-2		QQTG0205A	ENGLISH	1
○	8		QQFGKN470JA	Operating Instruction Manual, EP XM	1
○	8-1		QQTG0126A	ENGLISH	1
○	8-2		QQTG0206A	ENGLISH	1
○	8-3		QQTG0128A	ESPANOL	1
○	8-4		QQTG0207A	ESPANOL	1
○	8		QQFGKN470CA	Operating Instruction Manual, MC	1
○	8-1		QQTG0126A	ENGLISH	1
○	8-2		QQTG0206A	ENGLISH	1
○	8-3		QQTG0127A	FRANCAIS	1
○	8-4		QQTG0208A	FRANCAIS	1
○	8		QQFGKN470DA	Operating Instruction Manual, Others	1
○	8-1		QQTG0126A	ENGLISH	1
○	8-2		QQTG0206A	ENGLISH	1

	Ref. No.	Part No.	Description	P/S
○	8	QQFGKN470EA	Operating Instruction Manual, EZ EA	1
○	8-1	QQTG0129A	DEUTSCH	1
○	8-2	QQTG0209A	DEUTSCH	1
○	8	QQFGKN470FA	Operating Instruction Manual, EW	1
○	8-1	QQTG0127A	FRANCAIS	1
○	8-2	QQTG0208A	FRANCAIS	1
○	8-3	QQTG0129A	DEUTSCH	1
○	8-4	QQTG0209A	DEUTSCH	1
○	8-5	QQTG0131A	ITALIANO	1
○	8-6	QQTG0210A	ITALIANO	1
○	8	QQFGKN470GA	Operating Instruction Manual, EF	1
○	8-1	QQTG0127A	FRANCAIS	1
○	8-2	QQTG0208A	FRANCAIS	1
○	8-3	QQTG0131A	ITALIANO	1
○	8-4	QQTG0210A	ITALIANO	1
○	8	QQFGKN470HA	Operating Instruction Manual, EH	1
○	8-1	QQTG0130A	NERDERLANDS	1
○	8-2	QQTG0211A	NERDERLANDS	1
○	8-3	QQTG0127A	FRANCAIS	1
○	8-4	QQTG0208A	FRANCAIS	1
○	8-5	QQTG0129A	DEUTSCH	1
○	8-6	QQTG0209A	DEUTSCH	1
○	8	QQFGKN470KA	Operating Instruction Manual, X	1
○	8-1	QQTG0126A	ENGLISH	1
○	8-2	QQTG0206A	ENGLISH	1
○	8-3	QQTG0128A	ESPANOL	1
○	8-4	QQTG0207A	ESPANOL	1
○	8-5	QQTG0132A	中文	1
○	8-6	QQTG0212A	中文	1
○	8	QQFGKN470LA	Operating Instruction Manual, XT	1
○	8-1	QQTG0132A	中文	1
○	8-2	QQTG0212A	中文	1